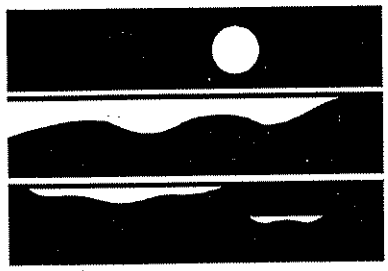

Olympus Terrace Sewer District
Wastewater Treatment Plant
Class II Inspection, October 16-19, 1995

May 1996

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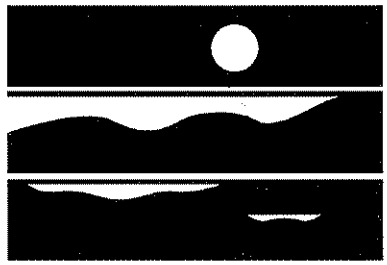

Olympus Terrace Sewer District Wastewater Treatment Plant Class II Inspection, October 16-19, 1995

by
Steven Golding

Environmental Investigations and Laboratory Services Program
Olympia, Washington 98504-7710

May 1996

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Abstract

A Class II inspection was conducted at the Olympus Terrace Sewer District Wastewater Treatment Plant (WWTP) on October 16-19, 1995. The plant was performing well during the inspection. The conventional parameters of BOD_5, TSS, and fecal coliform indicate a well-treated, high quality effluent. The WWTP was achieving substantial nitrification and may have been achieving denitrification at the time of the inspection.

Flow appeared to be turbulent at the upstream end of the flume, and the flume should be evaluated for accuracy. The oxidation ditch in use was being operated in a minimum dissolved oxygen mode. Dissolved oxygen in the ditch was found to be low but adequate to provide good treatment without objectionable odors. There is evidence of nitrification of the Olympus Terrace effluent sample after collection, resulting in non-representative NH_3-N and $NO_2 + NO_3$ results. The pretreated wastewater discharged to the Olympus Terrace collection system from Production Plating and TRAMCO met State permit limits for specified metals. Less than 10% of the loadings of metals (other than chromium and nickel) to the Olympus Terrace WWTP were accounted for by the two industrial sources sampled.

The fecal coliform count was higher than the maximum limit for Class A sewage sludge. All metals in the sludge sample were found in concentrations below EPA sludge application limits and ceiling concentrations for land application of municipal sludge.

Summary

Flume Configuration and Flow Measurements

The plant has a Parshall flume located between the clarifiers and chlorine contact chambers. Flow appeared to be turbulent at the upstream end of the flume, possibly causing inaccurate flow readings. Flow measurements as related to water depth were verified, but water depth may be affected by the upstream turbulence.

NPDES Permit Compliance/General Chemistry

The WWTP was performing well during the inspection. The effluent met National Pollutant Discharge Elimination System (NPDES) permit limits for 5-day inhibited biochemical oxygen demand (BOD INH or CBOD), total suspended solids (TSS), fecal coliform, and pH. The WWTP was achieving substantial nitrification and may have been achieving denitrification at the time of the inspection.

The pretreated wastewater discharged to the Olympus Terrace (OT) collection system from Production Plating and TRAMCO met State permit limits for specified metals, pH, and flow.

Oxidation Ditch Operation

The oxidation ditch was being operated in a minimum dissolved oxygen mode at the time of the inspection. Dissolved oxygen measurements at three locations around the ditch and at depths to six feet were in the range of 0.08 - 1.25 mg/L. The low dissolved oxygen concentrations in the ditch were associated with good plant performance and lack of odor problems at the time of the inspection, but dissolved oxygen concentrations were close to inadequate.

Split Sample Results

Ecology and OT laboratory analyses of the sample splits for each sample were in close agreement, with the exception of Eff-E NH_3 results. Analyses of influent samples taken by Ecology and OT and analyses of effluent samples taken by Ecology and OT showed good agreement, with the exception of Eff-E NH_3 results and total phosphorus. There is evidence that nitrification was taking place in the OT effluent sample after sample collection. It is recommended that possible causes of sample nitrification be investigated and eliminated.

Priority Pollutant Scans

Organics

Sixteen priority pollutant and other target volatile organic acid (VOA) compounds were detected in the influent samples and five were detected in the effluent samples. Other than acetone, the VOA compounds detected in the effluent were at concentrations of 0.87 mg/L or lower. Eleven base-neutral acid (BNA) compounds were detected in the influent sample and six were detected in the effluent sample. The BNAs detected in the effluent sample were in concentrations up to 10 mg/L. All VOA and BNA compounds found in the effluent were in concentrations below applicable State water quality standards.

Of the analyzed pesticides/PCBs, gamma-BHC (Lindane) was found at a concentration of 0.014 mg/L est. in the influent and 0.012 mg/L in the effluent, less than 10% of the State acute marine water quality criterion.

Metals

Eight priority pollutant metals were detected in the WWTP influent sample. Cadmium, copper, lead, mercury, silver, and zinc were found in the WWTP effluent. All metals found in the WWTP effluent were in concentrations below State water quality criteria with the exception of copper. Copper was found at a concentration of almost four times the acute criteria, but dilution of the effluent has not been considered in this analysis.

The pretreated wastewater discharged to the OT collection system from Production Plating and TRAMCO met State permit limits for specified metals.

A mass balance was performed on the Production Plating and TRAMCO metals, and these two loadings combined were compared with the measured OT influent loadings. The total loading from Production Plating and TRAMCO accounted for 75% of the estimated chromium loading and 14% of the nickel loading to the WWTP. Less than 10% of the loadings of metals to the WWTP during this inspection, other than chromium and nickel, could be attributed to Production Plating and TRAMCO.

Bioassays

Neither of the bioassay tests completed showed toxicity to the effluent sample. The fathead minnow 96-hour survival test and 7-day survival and growth test resulted in LC50s greater than 100% effluent and NOECs equal to 100% effluent.

The *Daphnia magna* acute test was not completed. An electrical power outage during the test prevented any meaningful results.

Sludge

The fecal coliform count (1,300,000/100gm) was higher than the 1,000/gm (100,000/100gm) maximum limit for Class A sewage sludge in accordance with EPA regulations. All metals found in the sludge were found in concentrations below EPA sludge application limits and ceiling concentrations for land application of municipal sludge.

Recommendations

- Plant personnel should continue to monitor dissolved oxygen in the oxidation ditch daily. Low dissolved oxygen conditions, as low as 0.08 mg/L during the inspection, indicate the potential for variations in influent strength and temperature to cause anaerobic conditions in portions of the oxidation ditch. Careful monitoring and plant operations can prevent this.

- The effluent flow meter should be checked regularly per manufacturer's recommendations, and meter accuracy assured. Entrance flow conditions should be assessed and corrected if necessary to assure proper flume operation.

- Possible causes of nitrification of Olympus Terrace effluent samples should be investigated and eliminated. Cleanliness of sampling lines, equipment, and containers and proper cooling of the sample at or below 4° C should be assured.

- Sludge from the plant applied to agricultural land should be applied in accordance with EPA (1993) Standards for the Use or Disposal of Sewage Sludge: Final Rules, 40 CFR Part 257.

Introduction

A Class II inspection was conducted at the Olympus Terrace Sewer District (OT) Wastewater Treatment Plant (WWTP) on October 16-19, 1995. Conducting the inspection were Steven Golding and Guy Hoyle-Dodson of the Ecology Toxics Investigations Section. Assisting from the OT staff was Gil Bridges (Plant Supervisor) and Julie J. W. Steed (Laboratory Technician). David Wright of the Northwest Regional Office requested the inspection.

Industrial contributors to the WWTP were also sampled. Based on having the largest estimated metals contributions, two industrial contributors were sampled: Production Plating and TRAMCO. Sampling of these contributors took place the day before sampling the WWTP. This allowed flow from the industrial contributors to be sampled and followed through the WWTP, which had an estimated detention time of 1.1 days.

TRAMCO remanufactures aircraft. The firm employs the Alodine (Amchem Products Co. trademark for chromium conversion coating) process in the metal finishing of parts. The pretreatment system receives both Alodine rinsewater and stripper water. Wastewater discharged from this process are classified under 40 CFR Part 433.17, PSNS (Pretreatment Standards for New Sources). The TRAMCO discharge to the OT collection system is regulated by State waste discharge permit #7291. The permit was issued on June 29, 1992 and expires on June 29, 1997.

Production Plating is employed in electroplating and metal finishing processes, electroplating (electrodeposition) of zinc, tin, copper, and nickel. The plant formerly electroplated cadmium but has eliminated this process in order to eliminate use of cyanide salts. Other processes are anodic coating (also known as anodizing) of aluminum using sulfuric and chromic acid solutions, chemfilm coating (also known as chromic acid conversion coating) of aluminum, and phosphate conversion coating of aluminum. The plant's pretreatment system is designed to remove metals and cyanides and to neutralize pH. The Production Plating discharge to the OT collection system is regulated by State waste discharge permit #5195. Ecology issued the permit on March 31, 1995. It expires on March 31, 1999.

The OT plant, located south of Mukilteo (Figure 1), serves residential areas within the sewer district, the City of Mukilteo, plus a portion of the industrial development adjoining Paine Field. The WWTP discharge into Puget Sound - Possession Sound is regulated by NPDES discharge permit #WA-002339-6. Ecology issued the permit on June 12, 1991. It expires on June 4, 1996.

The plant is an oxidation-type secondary treatment facility (Figure 2). Treatment units include coarse screening, grit removal, a mixing box reactor, two oxidation ditches, three

secondary clarifiers, two chlorine contact chambers, a drum thickener, and two aerobic digesters. Of the two oxidation ditches, the larger, oxidation ditch B, was being used as an oxidation ditch; the smaller, oxidation ditch A, was being used as an aerobic digester. Waste activated sludge is dewatered in a belt filter press, then transported by tank truck to a METRO wastewater facility in Renton.

Objectives of the inspection included:

1. Verify NPDES permit compliance

2. Monitor major industrial sources and assess metals contributions to aid in establishing permit limits

3. Verify sampling and laboratory procedures with split samples

4. Characterize wastewater toxicity with priority pollutant scans and bioassays

Procedures

Composite and grab samples were collected by Ecology at influent (Inf-E) and effluent (Eff-E) locations (Figure 2). Ecology conducted field measurements on influent and effluent samples as well as on the mixed liquor in the operating oxidation ditch. Olympus Terrace collected composite samples of influent (Inf-O) and effluent (Eff-O). TRAMCO and Production Plating composite samples were also taken by Ecology.

A more detailed description of sampling procedures appears in Appendix A. Sampling station descriptions appear in Table 1. The sampling schedule, parameters analyzed, and sample splits are included in Appendix B. Ecology analytical methods and laboratories performing the analyses are summarized in Appendix C. Ecology field and laboratory QA/QC are summarized in Appendix D. Quality assurance cleaning procedures are included in Appendix E. A glossary appears in Appendix H.

Results And Discussion

Flume Configuration and Flow Measurements

Olympus Terrace determines effluent flow from wastewater depth in a 12-inch Parshall flume. The flume is located between the clarifiers and chlorine contact chambers. Flow appeared to be turbulent at the upstream end of the flume. This may result in inaccurate flow readings since "the approaching flow should be relatively free of turbulence, eddies, and waves if accurate measurements are expected" (Grant, 1989).

Ecology recorded an instantaneous depth of water in the flume of 0.74 feet at 1153 on 10-18-95. This corresponds to a flow of 1.635 MGD (Grant, 1989). The plant flow meter was reading an instantaneous flow of 1.59 MGD at the same time, within 3% of the Ecology flow. This agreement in flow verifies the calibration of the plant flow meter to depth of water in the flume, but depth of water in the flume itself may be affected by upstream turbulence. Entrance flow conditions should be assessed to assure proper flume operation and corrected if necessary.

NPDES Permit Compliance/General Chemistry

The WWTP was performing well during the inspection. The conventional parameters of BOD_5, TSS, and fecal coliform indicate a well-treated, high quality effluent (Table 2). The effluent met National Pollutant Discharge Elimination System (NPDES) permit limits for 5-day inhibited biochemical oxygen demand (BOD INH or CBOD), total suspended solids (TSS), fecal coliform, and pH (Table 3).

Indicators that the plant was operating well within design constraints were effluent CBOD (<4 mg/L), TSS (5 mg/L) and flow (1.51 MGD) compared with permitted CBOD (25 mg/L monthly average), TSS (30 mg/L monthly average) and flow (2.27 MGD at 25 mg/L monthly average CBOD and 474 lbs/day).

A comparison of influent ammonia and nitrate-nitrite concentrations indicates that the WWTP was achieving substantial nitrification at the time of the inspection. Denitrification may also have been taking place, as evidenced by the low Eff-E $NO_2 + NO_3$-N concentration (0.198 mg/L est.). The finding of denitrification is consistent with observed low dissolved oxygen concentrations in the oxidation ditch (discussed in the following section of this report). Ammonia concentrations were reduced from 24.0 mg/L in the influent to 8.9 mg/L or less in the effluent. Alkalinity was correspondingly reduced from 189 mg/L in the influent to 101 mg/L in the effluent. The remaining 101 mg/L alkalinity in the effluent indicates that the concentration in the oxidation ditch was sufficient so as not to inhibit further nitrification.

The pretreated wastewater discharged to the OT collection system from Production Plating and TRAMCO met State permit limits for specified metals, pH, and flow (Tables 4 and 5).

Oxidation Ditch Operation

At the time of the inspection, Oxidation Ditch B was operating as an oxidation ditch. Oxidation Ditch A was in operation as a primary aerobic digester. Oxidation Ditch B was being operated so as to maintain minimum dissolved oxygen concentrations for anoxic/oxic operation. Only two of the ditch's four brush aerators were being operated. The two brushes operating were on the end of the oxidation ditch that is adjacent to the plant's clarifiers.

Ecology measured dissolved oxygen concentrations in Oxidation Ditch B at two times during the day on October 18, 1995. The measurements were made with a YSI portable dissolved oxygen membrane-probe meter. Measurements were made at three locations (Figure 2):

#1 between the two working brush aerators
#2 at the end of the oxidation ditch between the two non-operating brush rotors
#3 just upstream of the operating brush rotors

Measurements were made at three depths. The results were as follows:

LOCATION		#1	#2	#3
Time: 1000				
	Depth	Dissolved Oxygen Concentration, mg/L		
	Surface	1.2	0.25	0.16
	3 ft.	0.75	0.20	0.10
	6 ft.	0.80	0.20	0.08
Time:1315				
	Depth	Dissolved Oxygen Concentration, mg/L		
	Surface	1.25	0.49	0.19
	3 ft.	0.75	0.38	0.19
	6 ft.	0.65	0.30	0.15

Olympus Terrace measured dissolved oxygen concentrations near the surface of the oxidation ditch at station #1 at 0850 on October 18. Their measurements, 1.0 mg/L, 1.2 mg/L, and 1.2 mg/L, agree with Ecology's dissolved oxygen measurements. Plant Supervisor Gil Bridges stated that this low dissolved oxygen regime is the desired operating range for the oxidation ditch. The plants showed good performance and lack of odor problems at the time of the inspection, but dissolved oxygen concentrations were close to inadequate.

Split Sample Results

Samples were split to determine the comparability of Ecology and permittee laboratory results and sampling methods (Table 6). Ecology and OT laboratory analyses for each sample were in close agreement, within 20% for influent samples and within 4 mg/L for effluent samples with the exception of Eff-E NH_3-N results. The Ecology Eff-E NO_2 - NO_3 analysis found interference. The result was flagged as an estimate. The interference in NO_2 - NO_3 could have carried over into the ammonia analysis, giving elevated NH_3-N results for Eff-E, sample 428248 (Maggart, 1996).

Analyses of influent samples taken by Ecology (Inf-E) and OT (Inf-O) and analyses of effluent samples taken by Ecology (Eff-E) and OT (Eff-O) showed good agreement between Ecology and OT samples with the exception of Eff-E NH_3-N results (Table 6) and total phosphorus (Table 2). Total-P (0.030 mg/L) from the Ecology analysis of the Ecology sample is lower than expected for effluent from a typical oxidation ditch. The total P-result from the Ecology analysis of the OT effluent (3.29 mg/L) is within a typical range and is likely more representative.

While interference in NO_2 - NO_3-N could have caused an elevated NH_3 result, it appears likely that nitrification of the OT sample resulted in a lower NH_3-N concentration in Eff-O (1.64 mg/L) than in Eff-E (8.90 mg/L) and a correspondingly higher NO_2 - NO_3-N concentration in Eff-O (6.42 mg/L) than in Eff-E (0.198 mg/L est. - Table 2). Nitrification of the OT sample could result from inadequately cleaned sampling equipment, tubing, or sample storage containers. Sample storage at temperatures higher than the 4°C recommended temperature is another possible factor. It is recommended that possible causes of sample nitrification be investigated and eliminated.

Priority Pollutant Scans

Organics

Sixteen priority pollutant and other target volatile organic acid (VOA) compounds were detected in the influent samples (Table 7). Acetone was found in the highest concentration (351 mg/L est.). Because acetone is used in laboratory cleaning of equipment, the concentration found may not be representative of the influent. The other

VOA compounds detected were in low concentrations (5.2 mg/L or lower). Eleven base-neutral acid (BNA) compounds were detected in the influent sample. Caffeine was found at a concentration of 62 mg/L and 3B-Coprostanol was found at 399 mg/L est. Caffeine and 3B-Coprostanol are non-priority pollutant organics used as tracers of domestic wastewater effluents in receiving waters. All other detected BNA compounds in the influent sample were found at concentrations of 21 mg/L or lower.

Five priority pollutant and other target VOA compounds were detected in the effluent samples. Other than acetone (4.2 mg/L est.), the VOA compounds detected in the effluent were at concentrations of 0.87 mg/L est. or lower. Six BNA compounds were detected in the effluent at concentrations of up to 10 mg/L est. All VOAs and BNAs found in the effluent were found in concentrations below State water quality criteria (Table 7).

Of the analyzed pesticides/PCBs, gamma-BHC (Lindane) was found at a concentration of 0.014 mg/L est. in the influent and 0.012 mg/L in the effluent, less than 10% of the State acute marine water quality criterion.

No phenols-guaiacols-catechols were found in the effluent (Appendix F).

A complete list of parameters analyzed and analytical results is included in Appendix F . A number of tentatively identified compounds (TICs) were found in the influent samples in concentrations up to 2,440 mg/L (est.) TICs were found in the effluent samples in concentrations up to 170 mg/L (est.). TICs are summarized in Appendix G.

Metals

Of the eight priority pollutant metals detected in the WWTP influent sample, zinc was found in the highest concentration (401 mg/L). Cadmium, copper, lead, mercury, silver, and zinc were found in the WWTP effluent (Table 7). All metals found in the WWTP effluent were in concentrations below State water quality criteria with the exception of copper. Copper was found at a concentration of almost four times the acute criteria, but dilution of the effluent in the receiving water has not been considered in this analysis. It should be noted that all three transfer blanks showed detected concentrations of some metals.

The pretreated wastewater discharged to the OT collection system from Production Plating and TRAMCO met State permit limits for specified metals (Tables 4 and 5). Production Plating wastewater metals concentrations were roughly one tenth of State monthly average permit limits, with the exception of zinc, which was less than half the State monthly average permit limit. TRAMCO wastewater metals concentrations were less than one fiftieth of State monthly average permit limits, with the exception of cadmium, which was less than one third the State monthly average permit limit.

A mass balance can be performed on the Production Plating and TRAMCO metals. These two loadings combined are compared with the measured OT influent loadings in the following table. It should be recognized that the interval of one day between industrial sampling and OT influent sampling introduces some uncertainty into the comparison. While OT influent metals were measured as total recoverable and the Production Plating and TRAMCO loadings were measured as total metals, comparisons can be made since there is generally not much difference between total recoverable and total results. Where there is a difference, total recoverable results would be somewhat lower than total (Knox, 1996).

WWTP Influent Loadings and Industrial Contributor Wastewater Loadings

	OT influent metals loadings Total recoverable lbs/day	Inspection Results: Production Plating + TRAMCO loadings Total metals lbs/day	Max. Daily Permitted loadings: Production Plating + TRAMCO metals loadings Total metals lbs/day
Metals included in State permits:			
Cadmium	0.062	0.005	0.073
Chromium	0.091	0.068 est.	1.871
Copper	0.622	0.043	2.29
Lead	0.106	0.004	0.342
Nickel	<0.126	0.018	1.615
Zinc	5.05	0.20	2.100
Metals not included in State permits:			
Antimony	<0.378	<0.010	
Arsenic	0.023	0.0007	
Beryllium	<0.013	<0.0003	
Mercury	0.002	<0.00001	
Selenium	<0.025	<0.0007 est.	
Silver	0.251	0.0003	
Thallium	<0.031	<0.0004	

The total loading from Production Plating and TRAMCO accounted for 75% of the estimated chromium loading and 14% of the nickel loading to the WWTP. Over 90% of the loadings of metals other than chromium and nickel can be attributed to sources that have not been accounted for in this inspection.

The table on the previous page shows that influent loadings of cadmium, chromium, copper, lead, and zinc to the WWTP during the inspection were lower than maximum daily loadings permitted for Production Plating and TRAMCO. At the time of the

inspection, the zinc concentration in the OT effluent was 84% of chronic marine water quality standards and 76% of acute marine water quality criteria, not considering dilution of the effluent. Had Production Plating and TRAMCO been contributing the maximum daily load, zinc loading in the WWTP influent would have increased 42%. A 42% increase in zinc loadings may produce an exceedance of the State water quality criterion for zinc.

The results of this inspection indicate that the metals loading of the major industrial contributors to Olympus Terrace at the time of the inspection was not excessive. It should be noted again that discharges from Production Plating and TRAMCO vary considerably from day to day, and the Ecology composite samples were taken the day before OT influent samples were taken. It is not within the scope of this report to predict the effects of full permitted loadings on metals concentrations in the Olympus Terrace effluent but further investigation may be warranted.

Bioassays

Neither of the bioassay tests completed showed toxicity to the effluent sample (Table 8). The fathead minnow 96-hour survival test and 7-day survival and growth test resulted in LC50s greater than 100% effluent and NOECs equal to 100% effluent.

The *Daphnia magna* acute test was not completed successfully. An electrical power outage during the test prevented any meaningful results from being obtained (Stinson, 1996).

Sludge

Digested sludge is dewatered on a belt filter press. The dewatered sludge is applied to agricultural land.

The dried sludge sample contained 14.0% solids and 10.2% volatile solids. The fecal coliform count (1,300,000/100gm) was higher than the 1,000/gm (100,000/100gm) maximum limit for Class A sewage sludge in accordance with EPA regulations (EPA, 1993). Class A sewage sludge is suitable for use on agricultural lands without time restrictions to harvesting.

Three VOA compounds were found in the sludge sample (Table 9). Dichlorodifluoro-methane (14 mg/Kg-dry) was the VOA found in the highest concentration in the sludge. Seven BNA compounds were found in the sludge sample. The BNA compounds found in the highest concentrations in the sludge sample were 3B-Coprostanol (111,000 mg/Kg-dry) and 4-Methylphenol (15,100 mg/Kg-dry).

Twelve priority pollutant metals were detected in the sludge sample. Zinc was found in the highest concentration (598 mg/Kg-dry). All metals were found in concentrations below EPA sludge application limits and ceiling concentrations for land application of municipal sludge (Table 9).

A number of TICs were found in the sludge sample in concentrations up to 328,000 mg/Kg-dry (est.). TICs are summarized in Appendix G.

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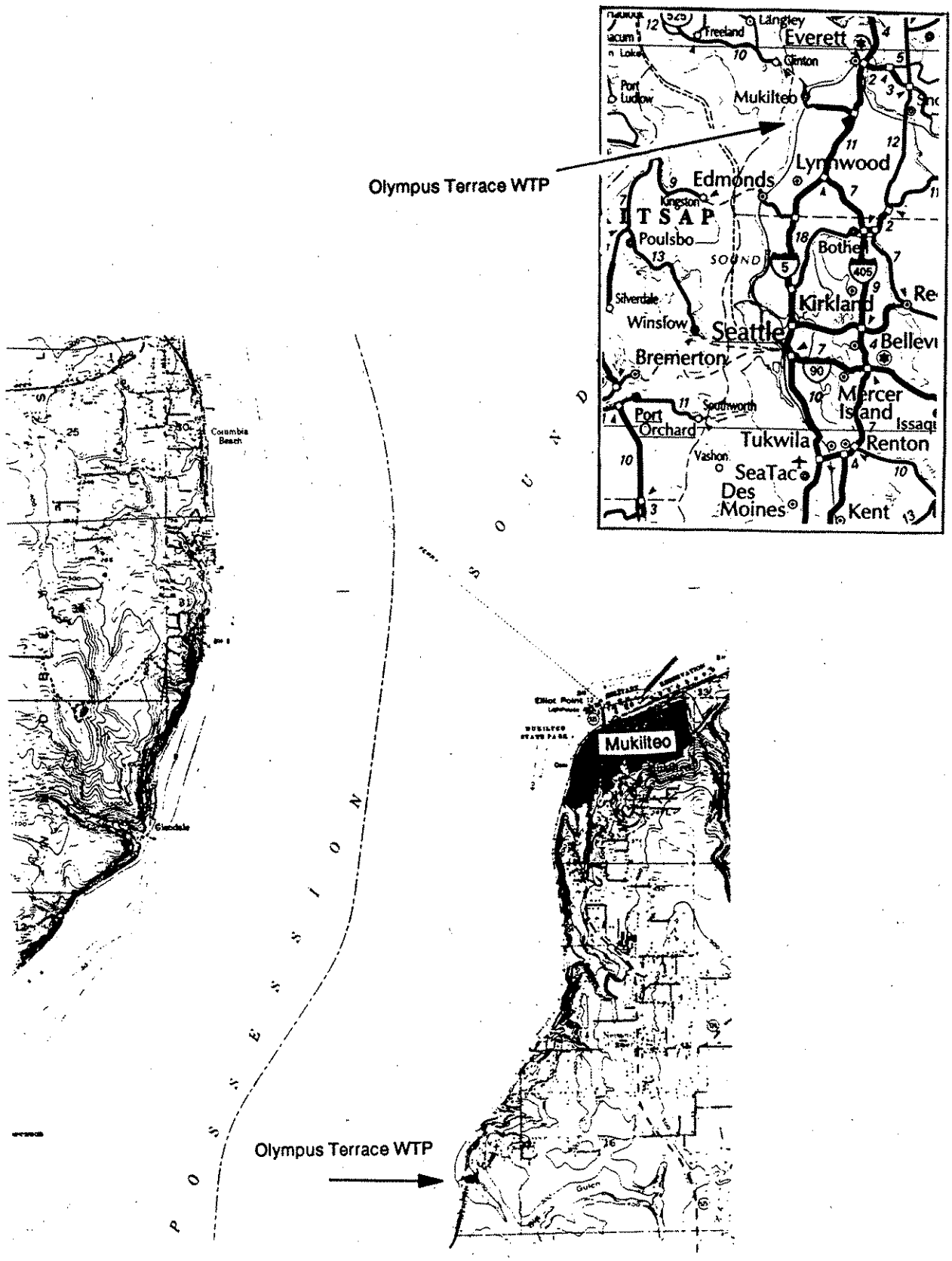

Figure 1 – Location Map – Olympus Terrace WTP, March 1992.

Figure 2 – Flow Schematic – Olympus Terrace, March 1992.

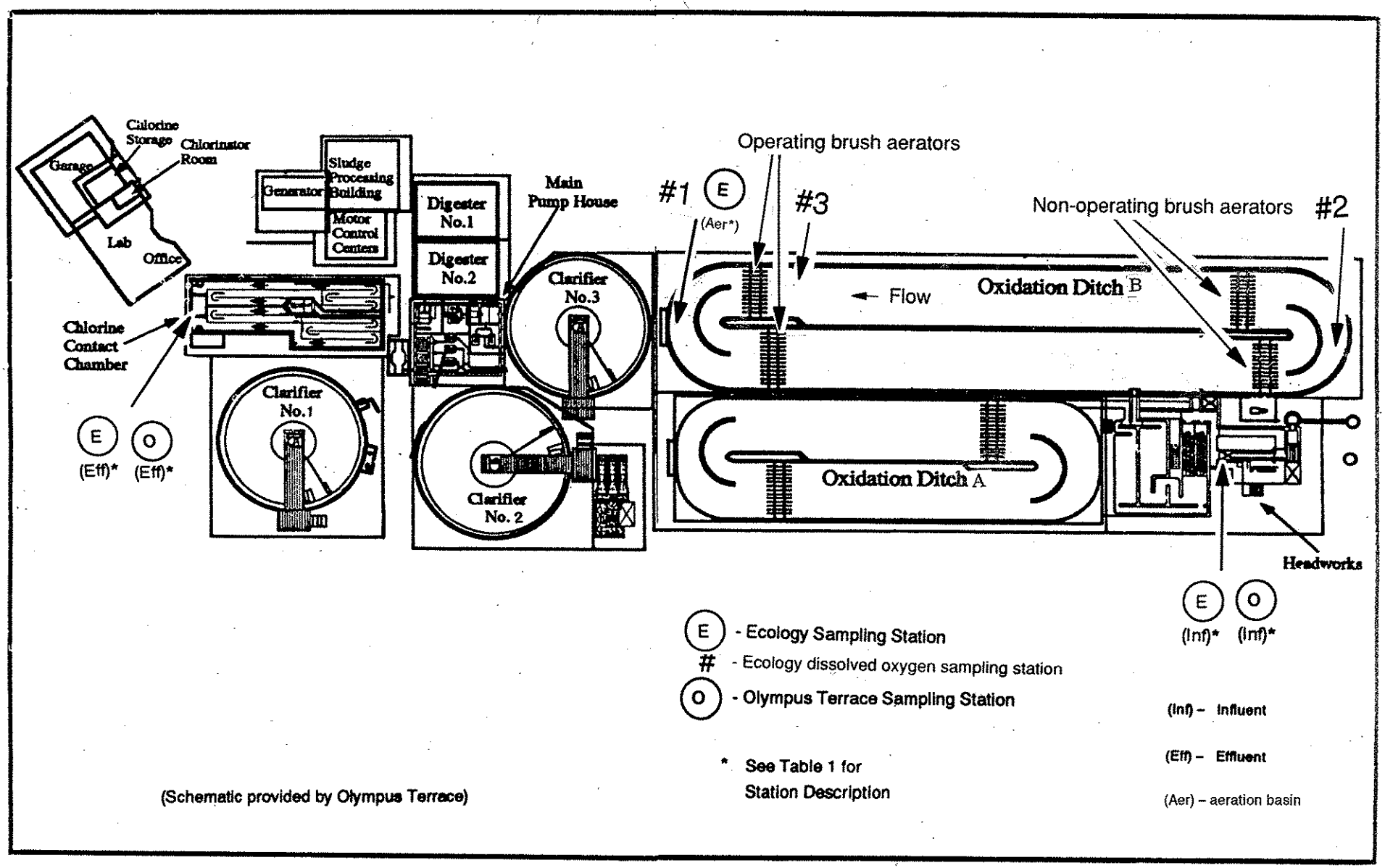

Table 1 - Sampling Station Descriptions - Olympus Terrace, October 1995.

Olympus Terrace

Ecology influent grab and composite samples (Inf-1,2; Inf-E)

Influent grab samples were taken from the grit channel downstream of the bar screen, 13 feet upstream of return activated sludge (RAS) inlet in a well-mixed area. The influent compositor sample intake was placed at the same location, 3 inches below the surface.

Olympus Terrace influent composite samples (Inf-O)

The Olympus Terrace influent compositor sample intake was placed in the grit channel downstream of the bar screen, 10 feet upstream of the RAS inlet.

Ecology effluent grab and composite samples (Eff-1,2; Eff-E, Eff-GC)

Influent grab and composite samples were taken just above the outfall weir of the effluent box which is just downstream of the chlorine contact chamber.

Olympus Terrace composite sample (Eff-O)

Effluent composite sample was taken from the effluent box just downstream of the chlorine contact chamber with the intake above the bottom of the box.

Ecology effluent grab - fecal coliform samples (Eff-3,4)

Chlorinated effluent was collected from the weir of the chlorine contact chamber.

Ecology aeration basin samples (Aer-1,2)

Grab samples were obtained in a well-mixed region between the two active brush rotors (Location #1).

Sludge (Sludge)

Sludge was taken from the belt filter press. Sludge was scooped directly into sample bottles.

Production Plating

Ecology wastewater discharge sample (ProdPlat)

The sampling strainer was placed in front of the outlet pipe of the effluent tank, a few inches below the surface.

TRAMCO

Ecology wastewater discharge sample (TRAMCO)

The sampling tube was placed in the holding tank, below the wastewater surface, so that a subsample would be collected even when there was no discharge. The sampler was set to begin at 0600, the time discharge was expected to begin.

Table 2 - General Chemistry Results - Olympus Terrace, October 1995.

Parameter	Location:	Inf-1	Inf-2	Inf-E	Inf-O	Aer-1	Aer-2	Eff-1	Eff-2
	Type:	grab	grab	comp	comp	grab	grab	grab	grab
	Date:	10/18	10/18	10/18-19	10/18-19	10/18	10/18	10/18	10/18
	Time:	1045	1350	0800-0800	0800-0800	1110	1430	1125	1505
	Lab Log #:	428236	428237	428246	428247	428238	428239	428240	428241
GENERAL CHEMISTRY									
Conductivity (umhos/cm)		572	645	739	698			492	504
Alkalinity (mg/L CaCO3)		174		189	191			102	
Hardness (mg/L CaCO3)				64.1E	54.1E				
TS (mg/L)				684	573				
TNVS (mg/L)				276	253				
TSS (mg/L)		305	213	206	183	2270	2070	5	6
TNVSS (mg/L)				38	35	415	381		
% Solids									
% Volatile Solids									
OXYGEN DEMAND PARAMETERS									
BOD5 (mg/L)				186	192				
BOD INH (mg/L)				187	179				
COD (mg/L)				390	340				
TOC (water mg/L)		58.1	67.2	59.8	56.6			8.5	8.8
TOC (soil - mg/kg dry)									
NUTRIENTS									
Total Kjeldahl Nitrogen (TKN) (mg/Kg-dry)									
NH3-N (water mg/L)				24.0	24.1				
NH3-N (soil ug/Kg-dry)									
NO2+NO3-N (water mg/L)				2.47	2.41				
NO2+NO3-N (soil ug/Kg dry)									
NO2-N (soil ug/Kg-dry)									
Total-P (mg/L)				5.69	5.62				
MISCELLANEOUS									
F-Coliform MF (#/100mL)									
F-Coliform (#/100gm)									
T-Coliform (#/100gm)									
FIELD OBSERVATIONS									
Temperature (C)		17.7	18.4					16.9	17.6
Temp-cooled (C)				1.5	5.4				
pH		7.7	7.7	9.4	8.2			7.2	7.1
Conductivity (umhos/cm)		584	630	801	743			507	526
Chlorine (mg/L)								<0.1	<0.1
	Free							<0.1	0.3
	Total								

Inf - influent
Eff - effluent
Aer - aeration basin
Sludge - sludge
grab - grab sample
comp - composite sample
grab-comp - grab-composite sample
E - Ecology
O - Olympus Terrace
ProdPlat - Production Plating, Inc.
TRAMCO - TRAMCO

Table 2 - (cont'd) - Olympus Terrace, October 1995.

Parameter II	Locatn:	TrnsblkO	Trnsblk2	Eff-E	Eff-O	Eff-GC	Eff-3	Eff-4	Sludge	ProdPlat	TRAMCO
	Type:	grab	grab	comp	comp	grab-comp	grab	grab	grab	comp	comp
	Date:	10/17	10/17	10/18-19	10/18-19	10/18	10/18	10/18	10/18	10/16-17	10/17
	Time:	1100	1105	0800-0800	0800-0800	1420	1505	1505	1400	1400-1400	0600-1530
	Lab Log #:	428234	428235	428248	428249	428242	428243	428244	428245	428230	428232
GENERAL CHEMISTRY											
Conductivity (umhos/cm)				505	507	501					
Alkalinity (mg/L CaCO3)				101	99.2	101					
Hardness (mg/L CaCO3)				52.6	53.1	54.1					
TS (mg/L)				329	383					2060	1510
TNVS (mg/L)				243	197						1130
TSS (mg/L)				5	7	5				284	43
TNVSS (mg/L)				2	3					211	13
% Solids									14.0		
% Volatile Solids									10.2		
OXYGEN DEMAND PARAMETERS											
BOD5 (mg/L)				6	10						
BOD INH (mg/L)				4U	4U						
COD (mg/L)				29	24						
TOC (water mg/L)				9.1	9.3						
TOC (soil - mg/kd-dry)									310,000		
NUTRIENTS											
Total Kjeldahl Nitrogen (TKN) (mg/Kg-dry)									40,000		
NH3-N (water mg/L)				8.90	1.64						
NH3-N (soil ug/Kg-dry)									271,000		
NO2+NO3-N (water mg/L)				0.198J	6.42						
NO2+NO3-N (soil ug/Kg-dry)									2720		
NO2-N (soil ug/Kg-dry)									1040		
Total-P (mg/L)				0.030	3.29						
MISCELLANEOUS											
F-Coliform MF (#/100mL)							130	110			
F-Coliform (#/100gm)								1,300,000			
T-Coliform (#/100gm)								7,900,00			
FIELD OBSERVATIONS											
Temperature (C)							17.6	17.6			
Temp-cooled (C)				3.0	7.2					5.1	6.1
pH				7.6	8.6		7.1	7.1		9.4	9.0
Conductivity (umhos/cm)				544	534		526	526		2650	2080
Chlorine (mg/L)											
	Free					<0.1	<0.1	<0.1			
	Total					<0.1	0.3	0.3			

Table 3 - NPDES Permit Limits and Inspection Results - Olympus Terrace, October 1995.

	NPDES Limits		Inspection Results	
Parameter	Monthly Average	Weekly Average	Composite Samples	Grab Samples
BOD INH (CBOD)	25 mg/L 474 lbs/day 85% removal	40 mg/L 759 lbs/day	<4 mg/L <50 lbs/day 98% removal	
TSS	30 mg/L 540 lbs/day 85% removal	45 mg/L 854 lbs/day	5 mg/L 63 lbs/day 98% removal	
Fecal Coliform	200/100 mL	400/100 mL		130/100 mL 110/100 mL
pH	6.0 to 9.0 (continuous)			
Flow*	--	--	1.51 MGD	

* prorated from instantaneous flow totalizer readings taken at 0916 on 10/18/95 to 0942 on 10/19/95.

Table 4 - State Permit Limits and Inspection Results - Production Plating, October 1995.

Parameter	State Limits		Inspection Results
	Max, for one day	Monthly Average	Composite Samples
Cadmium(T) (mg/L)	0.14	0.14	0.0136
Chromium(T) (mg/L)	3.6	2.5	0.256 est.
Copper(T) (mg/L)	4.4	1.8	0.160
Lead(T) (mg/L)	0.6	0.3	0.0151
Nickel(T) (mg/L)	2.6	1.8	0.064
Zinc(T) (mg/L)	4.2	1.8	0.769
Total Metals*(T) (mg/L)	10.5	5.0	1.249 est.
pH	6.5 - 10.0		9.4
Flow (process, gpd)	50,000	--	31,540**

T - Total metals laboratory analysis

*The term "Total Metals" is defined in the permit as the sum of Cu(T), Ni(T), Cr(T), and Zn(T).

**calculated as the differences of the readings for the two water meters that serve Production Plating. Meter readings taken at 1350 on 10-16-95 and at 1330 on 10-17-95.

Table 5 - State Permit Limits and Inspection Results - TRAMCO, October 1995.

Parameter	State Limits		Inspection Results
	Max, for one day	Monthly Average	Composite Samples
Cadmium(T) (mg/L)	0.11	0.07	0.0217
Chromium(T) (mg/L)	2.77	1.71	0.016 est.
Copper(T) (mg/L)	3.38	2.07	0.012
Lead(T) (mg/L)	0.69	0.43	<0.001
Nickel(T) (mg/L)	3.98	2.38	0.015
Zinc(T) (mg/L)	2.61	1.48	0.023
pH	6.0 to 11.0		9.0
Flow (process, gpd)	16,000	--	8,200*

T - Total metals laboratory analysis

"Total Metals" is defined as the sum of Cu(T), Ni(T), Cr(T) and Zn(T)

*calculated as difference in totalizer readings from 1530 on 10-16-95 to 1445 on 10-17-95.

Table 6 - Split Sample Results Comparison - Olympus Terrace, October 1995.

	Location:	Inf-E	Inf-O	Eff-E	Eff-O
	Type:	comp	comp	comp	comp
	Date:	10/18-19	10/18-19	10/18-19	10/18-19
	Time:	0800-0800	0800-0800	0800-0800	0800-0800
	Lab Log #:	428246	428247	428248	428249
	Sampled by:	Ecology	OT	Ecology	OT
Parameter	Analysis by:				
TSS (mg/L)					
	Ecology	206	183	5	7
	Olympus Terrace	203	178	4.7	4.5
BOD5 (mg/L)					
	Ecology	186	192	6	10
	Olympus Terrace	196	194	8.2	9.6
BODINH (mg/L) (CBOD)					
	Ecology	187	179	<4	<4
	Olympus Terrace	166	152	4.8	4.3
COD (mg/L)					
	Ecology	390	340	29	24
	Olympus Terrace	470	427	25	27.5
NH3-N (mg/L)					
	Ecology	24.0	24.1	8.90	1.64
	Olympus Terrace	--	--	3.1	2.7

Table 7 - Comparisons of VOAs, BNAs, and Pesticides/PCBs Detected With Water Quality Criteria - Olympus Terrace, October, 1995.

Location:	Inf-1	Inf-2	Eff-1	Eff-2	Sludge	EPA/Ecology Water Quality Criteria Summary	
Type:	grab	grab	grab	grab	grab	Acute Marine	Chronic Marine
Date:	10/18	10/18	10/18	10/18	10/18		
Time:	1045	1350	1125	1505	1400		
Lab Log#:	428236	428237	428240	428241	428245		
VOA Compounds	ug/L	ug/L	ug/L	ug/L	ug/Kg-dry	(ug/L)	(ug/L)
Dichlorodifluoromethane	1 UJ	1 UJ	1 UJ	1 UJ	**14**		
Trichlorofluoromethane	1 UJ	1 UJ	1 UJ	1 UJ	**2.7 J**		
Acetone	**4.7 J**	**351 E**	**4.2 J**	**3.8 J**	38 UJ		
Chloroform	**5.2**	**5**	**0.87 J**	**1**	7.5 U	12,000 *(a)	6,400 *(a)
2-Butanone (MEK)	**4.5**	**5**	**0.78 J**	2 U	7.5 U		
Bromodichloromethane	1 U	**0.52 J**	**0.49 J**	**0.47 J**	7.5 U	12,000 *(a)	6,400 *(a)
Benzene	**0.44 J**	**0.15 J**	1 U	1 U	7.5 U	5100 *	700 *
4-Methyl-2-Pentanone (MIBK)	**2.6 J**	**2.8 J**	4 U	4 U	7.5 U		
Toluene	**2.1**	**0.67 J**	**0.23 J**	**0.32 J**	7.5 UJ	6300 *	5000 *
Ethylbenzene	**1**	1 U	1 U	1 U	7.5 U		
Total Xylenes	**1.3 J**	1 UJ	6 U	6 U	7.5 UJ		
1,2,4-Trimethylbenzene	**0.19 J**	1 U	1 U	1 U	7.5 U		
1,3,5-Trimethylbenzene	**0.2 J**	2 U	2 U	2 U	7.5 U		
p-Isopropyltoluene	**1 J**	**1.4 J**	2 U	2 U	7.5 UJ		
1,4-Dichlorobenzene	**0.7 J**	**0.65 J**	1 U	1 U	7.5 UJ	1970 *(h)	
Naphthalene	**1.4 J**	5 U	5 U	5 U	7.5 UJ	2,350 *	
o-Xylene	**0.54 J**	1 UJ	2 U	2 U	7.5 U		
m&p-Xylene	**0.72 J**	4 U	4 U	4 U	7.5 UJ		

Location:	Inf-E	Eff-E	Sludge	EPA/Ecology Water Quality Criteria Summary	
Type:	comp	comp	grab	Acute Marine	Chronic Marine
Date:	10/18-19	10/18-19	10/18		
Time:	800-0800	0800-0800	1400		
Lab Log#:	428246	428248	428245		
BNA Compounds	ug/L	ug/L	ug/Kg-dry	(ug/L)	(ug/L)
Benzoic Acid	11 UJ	**5.9 J**	**7230 J**		
Isophorone	0.53 U	**0.44 J**	582 U	12,900 *	
Diethyl Phthalate	**9**	0.52 UJ	**392 J**	2,944 *(i)	3.4 *(i)
Di-n-Butyl Phthalate	**3.3**	0.52 U	582 U	2.944 *(i)	3.4 *(i)
Butylbenzyl Phthalate	**4 J**	5.2 U	**1220 J**	2.944 *(i)	3.4 *(i)
Benzyl Alcohol	**2.6**	0.52 U	582 UJ		
4-Methylphenol	0.53 U	**0.84**	**15100**		
1,4-Dichlorobenzene	**0.56**	0.52 U	582 U	1,970 *(h)	
Phenol	**0.81**	**0.63**	596 U	5,800 *	
Bis(2-Ethylhexyl) Phthalate	**21**	0.52 UJ	**8320**	3 *(i)	3 *(i)
Dimethyl Phthalate	0.5 J	0.52 U	**578 J**	3 *(i)	3 *(i)
Caffeine	**62**	**0.14 J**	582 U		
3B-Coprostanol	**399 E**	**10 J**	**111000**		
Pesticide/PCB Compounds	ug/L	ug/L	ug/Kg-dry	(ug/L)	(ug/L)
gamma-BHC (Lindane)	**0.014 J**	**0.012**	29 U	0.16	

U	The analyte was not detected at or above the reported result.
J	The analyte was positively identified. The associated numerical result is an estimate.
UJ	The analyte was not detected at or above the reported estimated result.
NJ	There is evidence that the analyte is present. The associated numerical result is an estimate.
E	The concentration of the associated value exceeds the known calibration range.
Bold	detected analyte

Table 7 - (cont'd) - Olympus Terrace, October 1995.

Location:	Inf-E	Eff-E	TrnsblkO	Trnsblk2	ProdPlat	TRAMCO	TrnsblkP	TrnsblkT	Sludge	State Water Quality Criteria Summary	
Type:	comp	comp	grab	grab	comp	comp	grab	grab	grab		
Date:	10/18-19	10/18-19	10/17	10/17	10/16-17	10/17	10/16	10/16	10/18	Acute	Chronic
Time:	0800-0800	800-0800	1100	1105	400-1400	800-1530	1355	1530	1400	Marine	Marine
Lab Log #:	428246	428246	428234	428235	428230	428232	428231	428233	428245		
	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/Kg-dry	ug/L	ug/L
Metals + +	Total-Recov.	tal-Recov.	Total-Recov.	Total-Recov.	Total	Total	Total	Total	Total		
Antimony	30 U	30 U	30 U	30 U	30 U	30 U	30 U	30 U	7.4		
Arsenic	1.8	1.5 U	1.5 U	1.5 U	2.5	1.5 U	1.5 U	1.5 U	2.8		
Pentavalent										2,319 *	13 *
Trivalent										69	36.00
Beryllium	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.14		
Cadmium	4.96	0.82	0.30	0.94	13.6	21.7	0.1 U	0.1 U	7.8	37.20	8.0000
Chromium											
Total recoverable	7.2	5 U	5 U	5 U							
Total					256 J	16 J	5 U	5 U	205		
Hexavalent										1,100	50
Trivalent										10,300 *	
Copper	49.4	11	4 U	4 U	160	12	6 U	6 U	438	3	
Lead	8.4	1.5	1 U	8.0	15.1	1 U	1 U	1 U	63.5	151	6
Mercury (Total)	0.16	0.10	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.582 J	2	0.025
Nickel	10 U	10 U	10 U	10 U	64	15	10 U	10 U	68.5	71	8
Selenium	2 U	2 U	2 U	2 U	2 UJ	2 UJ	2 UJ	2 UJ	7.88	300	71
Silver	19.9	0.83	0.5 U	0.5 U	1.3	0.5 U	0.5 U	0.5 U	155	1.2	
Thallium	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	0.5 U	2,130 *	
Zinc	401	64.5	4.6	4.3	769	23	11	11	598	65	77

'NOTE: SOME INDIVIDUAL COMPOUND CRITERIA OR LOELS MAY NOT AGREE WITH GROUP CRITERIA OR LOELS.
REFER TO APPROPRIATE EPA DOCUMENT ON AMBIENT WATER QUALITY CRITERIA FOR FULL DISCUSSION.

U The analyte was not detected at or above the reported result.

UJ The analyte was not detected at or above the reported estimated result.

Bold detected analyte

Exceeds State Water Quality Criterion

Table 8 - Effluent Bioassay Results* - Olympus Terrace, October 1995.

* - All tests were run on effluent, Eff-GC, lab log # 428242

Fathead Minnow - 96-hour survival test
(Pimephales promelas)

Sample Concentration	# Tested*	Percent Survival	
Control	40	100	LC50>100%
6.25% Effluent	40	100	NOEC=100%
12.5% Effluent	40	100	
25% Effluent	40	97.5	
50% Effluent	40	100	
100% Effluent	40	97.5	

*4 replicates per concentration, 10 organisms per replicate.

Fathead Minnow - 7 day survival and growth test
(Pimephales promelas)

Sample Concentration	# Tested	Percent Survival	Average Weight per Fish (mg)
Control	40	95	0.264
6.25% Effluent	40	97.5	0.261
12.5% Effluent	40	97.5	0.255
25% Effluent	40	92.5	0.275
50% Effluent	40	100	0.282
100% Effluent	40	100	0.275

LC50>100%
NOEC for survival = 100%
NOEC for growth = 100%

*4 replicates per concentration, 10 organisms per replicate.

Table 9 - Sludge Organic Compounds and Comparison of Metals Detected to EPA Criteria for Land Application - Olympus Terrace, October 1995.

Location:	Sludge
Type:	grab
Date:	10/18
Time:	1400
Lab Log #:	428245
	ug/Kg-dry

VOA Compounds

Dichlorodifluoromethane	14
Trichlorofluoromethane	2.7J
Tetrachloroethene	0.3J

BNA Compounds

4-Methylphenol	15100
Benzoic Acid	7230 J
Dimethylphthalate	578J
Diethylphthalate	392J
Butylbenzylphthalate	1220J
Bis(2-Ethylhexyl)Phthalate	8320
3B-Coprostanol	111000

Metals (total)

	Sludge grab 10/18 1400 428245 mg/Kg-dry	EPA Sludge Application Limits (monthly avg.) mg/Kg-dry	EPA Ceiling Concentrations mg/Kg-dry
Antimony	7.4		
Arsenic	2.8	41	75
Beryllium	0.14		
Cadmium	7.8	39	85
Chromium	205	1200	3000
Copper	438	1500	4300
Lead	63.5	300	840
Mercury	0.582J	17	57
Nickel	68.5	420	420
Selenium	7.88	36	100
Silver	155		
Thallium	0.5U		
Zinc	598	2800	7500

Sludge - sludge sample
grab - grab sample

U - The analyte was not detected at or above the reported result.
J - The analyte was positively identified. The associated numerical result is an estimate.

Appendices

Appendix A - Sampling Procedures - Olympus Terrace, October 1995.

Ecology Isco composite samplers were set up to collect equal volumes of sample every 30 minutes for 24 hours. The TRAMCO sampler was set to collect for a shorter duration to correspond with actual wastewater production from the facility. The samples were then divided into subsamples for analysis. The compositors were iced to preserve samples.

The composite influent and effluent samplers operated by Olympus Terrace were set to collect sample volumes proportionate to flow.

Ecology influent and effluent composite samples and Olympus Terrace influent and effluent composite samples were split for both Ecology and Olympus Terrace laboratory analysis. Sampler configurations and locations are summarized in Figure 2 and Table 1.

Appendix B - Sampling Schedule - Olympus Terrace, October 1995.

Parameter	Location:	Inf-1	Inf-2	Inf-E	Inf-O	Aer-1	Aer-2	Eff-1	Eff-2
	Type:	grab	grab	comp	comp	grab	grab	grab	grab
	Date:	10/18	10/18	10/18-19	10/18-19	10/18	10/18	10/18	10/18
	Time:	1045	1350	0800-0800	0800-0800	1110	1430	1125	1505
	Lab Log #:	428236	428237	428246	428247	428238	428239	428240	428241
GENERAL CHEMISTRY									
Conductivity (umhos/cm)		E	E	E	E			E	E
Alkalinity (mg/L CaCO3)		E		E	E			E	
Hardness (mg/L CaCO3)				E	E				
TS (mg/L)				E	E				
TNVS (mg/L)				E	E				
TSS (mg/L)		E	E	EO	EO	E	E	E	E
TNVSS (mg/L)				E	E	E	E		
% Solids									
% Volatile Solids									
OXYGEN DEMAND PARAMETERS									
BOD5 (mg/L)				EO	EO				
BOD INH (mg/L)				EO	EO				
COD (mg/L)				EO	EO				
TOC (water mg/L)		E	E	E	E			E	E
TOC (soil)									
NUTRIENTS									
Total Kjeldahl Nitrogen (TKN) (mg/Kg-dry)									
NH3-N (water mg/L)				E	E				
NH3-N (soil ug/Kg-dry)									
NO2+NO3-N (water mg/L)				E	E				
NO2+NO3-N (soil ug/Kg-dry)									
NO2-N (soil ug/Kg-dry)									
Total-P (mg/L)				E	E				
MISCELLANEOUS									
F-Coliform MF (#/100mL)									
F-Coliform (#/100gm)									
T-Coliform (#/100gm)									
FIELD OBSERVATIONS									
Temperature (C)		E	E					E	E
Temp-cooled (C)				E	E				
pH		E	E	E	E			E	E
Conductivity (umhos/cm)		E	E	E	E			E	E
Chlorine (mg/L)								E	E
	Free							E	E
	Total								

Inf - influent
Eff - effluent
Aer - aeration basin
Sludge - sludge
grab - grab sample
comp - composite sample
grab-comp - grab composite sample

E- Ecology sampling and analyses
O- OT sampling and analyses

TrnsblkO - transfer blank for OT effluent
Trnsblk2 - duplicate of TrnsblkO

ProdPlat - Production Plating, Inc.
TRAMCO - TRAMCO

Appendix B - (cont'd) - Olympus Terrace, October 1995.

Parameter II	Locatn:	TrnsblkO	Trnsblk2	Eff-E	Eff-O	Eff-GC	Eff-3	Eff-4	Sludge	ProdPlat	TRAMCO
	Type:	grab	grab	comp	comp	ab-comp	grab	grab	grab	comp	comp
	Date:	10/17	10/17	10/18-19	10/18-19	10/18	10/18	10/18	10/18	10/16-17	10/17
	Time:	1100	1105	0800-0800	0800-0800	1420	1505	1505	1400	1400-1400	0600-1530
	Lab Log #:	428234	428235	428248	428249	428242	428243	428244	428245	428230	428232
GENERAL CHEMISTRY											
Conductivity (umhos/cm)				E	E	E					
Alkalinity (mg/L CaCO3)				E	E	E					
Hardness (mg/L CaCO3)				E	E	E					
TS (mg/L)				E	E					E	E
TNVS (mg/L)				E	E						E
TSS (mg/L)				EO	EO	E				E	E
TNVSS (mg/L)				E	E					E	E
% Solids									E		
% Volatile Solids									E		
OXYGEN DEMAND PARAMETERS											
BOD5 (mg/L)				EO	EO						
BOD INH (mg/L)				EO	EO						
COD (mg/L)				EO	EO						
TOC (water mg/L)				E	E						
TOC (soil)									E		
									E		
NH3-N (water mg/L)				EO	EO						
NH3-N (soil ug/Kg-dry)									E		
NO2 + NO3-N (water mg/L)				E	E						
NO2 + NO3-N (soil ug/Kg-dry)									E		
NO2-N (soil ug/Kg-dry)									E		
Total-P (mg/L)				E	E						
MISCELLANEOUS											
F-Coliform MF (#/100mL)							E	E			
F-Coliform (#/100gm)									E		
T-Coliform (#/100gm)									E		
FIELD OBSERVATIONS											
Temperature (C)							E	E			
Temp-cooled (C)				E	E					E	E
pH				E	E		E	E		E	E
Conductivity (umhos/cm)				E	E		E	E		E	E
Chlorine (mg/L)											
Free						E	E	E			
Total						E	E	E			

Appendix C - Ecology Analytical Methods - Olympus Terrace, October 1995.

Laboratory Analysis	Method Used for Ecology Analysis	Laboratory Performing Analysis
Conductivity	EPA, Revised 1983: 120.1	Manchester Laboratory
Alkalinity	EPA, Revised 1983: 310.1	Manchester Laboratory
Hardness	EPA, Revised 1983: 130.2	Manchester Laboratory
TS	EPA, Revised 1983: 160.3	Manchester Laboratory
TNVS	EPA, Revised 1983: 160.3	Manchester Laboratory
TSS	EPA, Revised 1983: 160.2	Manchester Laboratory
TNVSS	EPA, Revised 1983: 160.2	Manchester Laboratory
% Solids	APHA, 1989: 2540G.	Manchester Laboratory
% Volatile Solids	EPA, Revised 1983, 160.4	Manchester Laboratory
BOD5	EPA, Revised 1983: 405.1	Manchester Laboratory
BOD INH	EPA, Revised 1983: 405.1	Manchester Laboratory
COD	EPA, Revised 1983: 410.1	Sound Analytical Services
TOC (water)	EPA, Revised 1983: 415.1	Manchester Laboratory
TOC (soil/sed)	EPA, Revised 1983: 415.1	Sound Analytical Services
Total Kjeldahl N	EPA, Revised 1983: 351.3	Sound Analytical Services
NH3-N	EPA, Revised 1983: 350.1	Manchester Laboratory
NO2+NO3-N	EPA, Revised 1983: 353.2	Manchester Laboratory
NO2-N	EPA, Revised 1983: 353.2	Manchester Laboratory
Total P	EPA, Revised 1983: 365.3	Manchester Laboratory
F-Coliform MF	APHA, 1989: 9222D.	Manchester Laboratory
F-Coliform (soil/sed)	APHA, 1989: 9221A.	Manchester Laboratory
T-Coliform (soil/sed)	APHA, 1989: 9221A.	Manchester Laboratory
VOC (water)	EPA, 1986: 8260	Manchester Laboratory
VOC (soil/sed)	EPA, 1986: 8240	Manchester Laboratory
BNAs (water)	EPA, 1986: 8270	Manchester Laboratory
BNAs (soil/sed)	EPA, 1986: 8270	Manchester Laboratory
Pest/PCB (water)	EPA, 1986: 8080	Manchester Laboratory
Pest/PCB (soil/sed)	EPA, 1986: 8080	Manchester Laboratory
Guaiacols (effluent)	NCASI, 1986: 498B.	Manchester Laboratory
PP Metals (water)	EPA, Revised 1983: 200-299	Manchester Laboratory
PP Metals (soil/sed)	EPA, Revised 1983: 200-299	Manchester Laboratory
Daphnia magna (acute)	EPA 1991	Manchester Laboratory
Fathead Minnow (acute)	EPA 1991	Parametrix
Fathead Minnow (chronic)	EPA 1989	Parametrix

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Appendix D - Quality Assurance/Quality Control (QA/QC) - Olympus Terrace, October 1995.

SAMPLING QA/QC

Ecology quality assurance procedures for sampling included cleaning of the sampling equipment for priority pollutant analyses prior to the inspection to prevent sample contamination (Appendix E). Chain-of-custody procedures were followed to assure the security of the samples (Ecology, 1994).

LABORATORY QA/QC

General Chemistry Analysis

COD and TKN analyses were performed within the method holding times. The TOC method blank demonstrated that the process was free from contamination. All TOC, COD, and TKN recoveries were within QC limits of +/- 25%. Replicate results were within QC limits of +/- 20% of the original analyses.

Temperatures of Ecology composite samples were at or below the 4°C criterion. Olympus Terrace samples were somewhat warmer than the criterion, at 5.4°C for Inf-O and 7.2°C for Eff-O. All samples were chilled immediately after splitting.

VOA, BNA, Pesticides/PCB, and Phenols-Guaiacols-Catechols Priority Pollutant Organics Analysis

Low levels of certain target compounds were detected in the laboratory blanks. If the concentrations of the compounds in the sample are greater than or equal to five times the concentrations of the compounds in the associated method blank, they are considered native to the sample. Surrogate recoveries and holding times were acceptable.

Low levels of some target compounds were detected in the BNA laboratory blanks. The EPA five times rule was applied to all target compounds which were found in the blank. Surrogate recoveries and holding times were acceptable. No special analytical problems were encountered in the BNA analyses.

No analytes of interest were detected in the pesticides/PCB method blanks. Holding times were met. Initial calibration was acceptable with one exception which did not affect the results. Surrogate recoveries were acceptable in all samples. Decachlobiphenyl (DCB) was recovery was slightly low but no qualification of results was required. Interference was present in sample 422846, inhibiting detection of Alpha-BHC through Methoxychlor. The quantitation limits have been raised for the analytes where the interference occurred. 4,4'-DDD and Methoxychlor were detected in sample 428245. Both analytes have been qualified with NJ in this sample.

Holding times for chlorinated guaiacols, catechols, phenols was within recommended limits. Low levels of phenol were detected in the laboratory blanks. The EPA five times rule was applied. All

surrogate spike recoveries were within acceptable QC limits except for 2,4-dichlorophenol-d4 which had less than 10% recovery in the sample. Since the other surrogates were within acceptable limits no qualifiers were added to the sample results. All matrix spike recoveries were within acceptable limits. No analytical problems were encountered in the analysis.

Metals Analysis

Metals data quality for this project is generally very good. Selenium results for the total analysis are estimated at the detection limit ("UJ") because the spike recoveries were low. Some of the mercury results are also estimated at the detection limit due to low spike recoveries. The chromium results for the total analysis are estimated ("J") due to a high spike recovery. Holding times and instrument calibration were acceptable. Procedural blanks showed no anlalytically significant levels of analytes.

LABORATORY AUDIT

The Olympus Terrace laboratory was accredited on April 28, 1993. The accredition expires on April 27, 1996.

Appendix E - Priority Pollutant Cleaning Procedures - Olympus Terrace, October 1994.

PRIORITY POLLUTANT SAMPLING EQUIPMENT CLEANING PROCEDURES

1. Wash with laboratory detergent
2. Rinse several times with tap water
3. Rinse with 10% HNO3 solution
4. Rinse three (3) times with distilled/deionized water
5. Rinse with high purity acetone
6. Rinse with high purity hexane
7. Allow to dry and seal with aluminum foil

Appendix F - VOA, BNA, Pesticide/PCB, Metals Scan, and Phenols-Guaiacols-Catechols Results - Olympus Terrace, October, 1995.

Location:	Inf-1	Inf-2	Eff-1	Eff-2	Sludge
Type:	grab	grab	grab	grab	grab
Date:	10/18	10/18	10/18	10/18	10/18
Time:	1045	1350	1125	1505	1400
Lab Log#:	428236	428237	428240	428241	428245
	ug/L	ug/L	ug/L	ug/L	ug/Kg-dry
VOA Compounds					
Chloromethane	1 UJ	1 UJ	1 UJ	1 UJ	7.5 UJ
Dichlorodifluoromethane	1 UJ	1 UJ	1 UJ	1 UJ	14
Bromomethane	2 UJ	2 UJ	2 UJ	2 UJ	7.5 UJ
Chloroethane	2 UJ	2 UJ	2 UJ	2 UJ	7.5 U
Trichlorofluoromethane	1 UJ	1 UJ	1 UJ	1 UJ	2.7 J
Methylene Chloride	1 UJ	5 U	5 U	5 U	7.5 UJ
Acetone	47 J	351 E	4.2 J	3.8 J	38 UJ
Carbon Disulfide	2 U	2 UJ	2 UJ	2 UJ	7.5 UJ
1,1-Dichloroethene	2 UJ	2 UJ	2 UJ	2 UJ	7.5 U
1,1-Dichloroethane	1 U	1 U	1 U	1 U	7.5 U
trans-1,2-Dichloroethene	2 U	2 U	2 U	2 U	7.5 U
cis-1,2-Dichloroethene	1 U	1 U	1 U	1 U	7.5 U
2,2-Dichloropropane	2 U	2 U	2 U	2 U	7.5 U
Bromochloromethane	1 U	1 U	1 U	1 U	7.5 U
Chloroform	5.2	5	0.87 J	1	7.5 U
1,2-Dichloroethane	1 U	1 U	1 U	1 U	7.5 U
2-Butanone (MEK)	4.5	5	0.78 J	2 U	7.5 U
1,1,1-Trichloroethane	2 U	2 U	2 U	2 U	7.5 U
Carbon Tetrachloride	2 U	2 U	2 U	2 U	7.5 U
1,1-Dichloropropene	1 U	1 U	1 U	1 U	7.5 U
Vinyl Chloride	1 UJ	1 UJ	1 UJ	1 UJ	7.5 U
Bromodichloromethane	1 U	0.52 J	0.49 J	0.47 J	7.5 U
1,2-Dichloropropane	1 U	1 U	1 U	1 U	7.5 U
Dibromomethane	1 U	1 U	1 U	1 U	7.5 U
trans-1,3-Dichloropropene	1.9 U	1.9 U	1.9 U	1.9 U	19 U
Trichloroethene	2 U	2 U	2 U	2 U	7.5 UJ
Dibromochloromethane	2 U	2 U	2 U	2 U	19 U
1,2-Dibromoethane (EDB)	1 U	1 U	1 U	1 U	7.5 U
1,1,2-Trichloroethane	1 U	1 U	1 U	1 U	7.5 U
1,3-Dichloropropane	1 U	1 U	1 U	1 U	7.5 U
Benzene	0.44 J	0.15 J	1 U	1 U	7.5 U
cis-1,3-Dichloropropene	1.1 U	1.1 U	1.1 U	1.1 U	7.5 U
Bromoform	5 U	5 U	5 U	5 U	7.5 U
2-Hexanone	4 U	4 U	4 U	4 U	7.5 U
4-Methyl-2-Pentanone (MIBK)	2.6 J	2.8 J	4 U	4 U	7.5 U
Tetrachloroethene	1 U	1 U	1 U	1 U	0.3 J
1,1,2,2-Tetrachloroethane	1 U	1 U	1 U	1 U	7.5 U
1,1,1,2-Tetrachloroethane	1 U	1 U	1 U	1 U	7.5 U
Toluene	2.1	0.67 J	0.23 J	0.32 J	7.5 UJ

U The analyte was not detected at or above the reported result.

J The analyte was positively identified. The associated numerical result is an estimate.

UJ The analyte was not detected at or above the reported estimated result.

E The concentration of the associated value exceeded the known calibration range.

Appendix F - (cont'd) - Olympus Terrace, October 1995

Location:	Inf-1	Inf-2	Eff-1	Eff-2	Sludge
Type:	grab	grab	grab	grab	grab
Date:	10/18	10/18	10/18	10/18	10/18
Time:	1045	1350	1125	1505	1400
Lab Log#:	428236	428237	428240	428241	428245
VOA Compounds (cont'd)	ug/L	ug/L	ug/L	ug/L	ug/Kg-dry
Ethylbenzene	1	1 U	1 U	1 U	7.5 U
Styrene (Ethenylbenzene)	2 U	1 UJ	2 U	2 U	7.5 U
Bromobenzene	1 U	1 U	1 U	1 U	7.5 U
1,2,3-Trichloropropane	1 U	1 U	1 U	1 U	7.5 U
2-Chlorotoluene	2 U	2 U	2 U	2 U	7.5 U
4-Chlorotoluene	2 U	2 U	2 U	2 U	7.5 U
Total Xylenes	1.3 J	1 UJ	6 U	6 U	7.5 UJ
1,2,4-Trimethylbenzene	0.19 J	1 U	1 U	1 U	7.5 U
tert-Butylbenzene	2 U	2 U	2 U	2 U	7.5 U
1,3,5-Trimethylbenzene	0.2 J	2 U	2 U	2 U	7.5 U
sec-Butylbenzene	2 U	2 U	2 U	2 U	7.5 U
p-Isopropyltoluene	1 J	1.4 J	2 U	2 U	7.5 UJ
n-Butylbenzene	1 U	1 U	1 U	1 U	7.5 UJ
1,2-Dibromo-3-Chloropropane (DBCP)	2 U	2 U	2 U	2 U	7.5 U
1,2,3-Trichlorobenzene	5 U	5 U	5 U	5 U	7.5 UJ
Isopropylbenzene	5 U	5 U	5 U	5 U	7.5 U
n-Propylbenzene	1 U	1 U	1 U	1 U	7.5 U
1,4-Dichlorobenzene	0.7 J	0.65 J	1 U	1 U	7.5 UJ
1,2-Dichlorobenzene	1 U	1 U	1 U	1 U	7.5 UJ
1,2,4-Trichlorobenzene	5 U	5 U	5 U	5 U	7.5 UJ
Naphthalene	1.4 J	5 U	5 U	5 U	7.5 UJ
Hexachlorobutadiene	1 U	1 U	1 U	1 U	7.5 U
o-Xylene	0.54 J	1 UJ	2 U	2 U	7.5 U
1,3-Dichlorobenzene	1 U	1 U	1 U	1 U	7.5 U
m&p-Xylene	0.72 J	4 U	4 U	4 U	7.5 UJ
Ethyl Ether	1 UJ	5 UJ	5 UJ	5 UJ	7.5 U
Methyl Iodide	4.5 UJ	5 UJ	5 UJ	2 UJ	7.5 U
Allyl Chloride	5 U	5 U	5 U	5 U	38 U
Acrylonitrile	1 U	1 U	1 U	1 U	19 U
2-Methyoxy-2-Methylpropane	1 U	1 U	1 U	1 U	7.5 U
Methyl acrylate	1 U	1 U	1 U	1 U	7.5 U
Propionitrile	5 U	5 U	5 U	5 U	188 UJ
Methacrilonitrile	1 U	1 U	1 U	1 U	151 U
Tetrahydrofuran	1 U	1 U	1 U	1 U	7.5 U
1-Chlorobutane	1 U	1 U	1 U	1 U	7.5 U
Methyl Methacrylate	1 U	1 U	1 U	1 U	151 U
Propane, 2-Nitro	5 U	5 U	5 U	5 U	7.5 UJ
Chloroacetonitrile	5 UJ	5 UJ	5 UJ	5 UJ	151 UJ
1,1-Dichloropropanone	2 U	2 U	2 U	2 U	151 U
Ethylmethacrylate	2 U	2 U	2 U	2 U	151 U
Trans-1,4-Dichloro-2-butene	1 U	1 U	1 U	1 U	7.5 U
Pentachlorethane	1 U	1 U	1 U	1 U	7.5 U
Hexachloroethane	1 U	1 U	1 U	1 U	7.5 U
Nitrobenzene	10 U	10 U	10 U	10 U	38 UJ

U The analyte was not detected at or above the reported result.

J The analyte was positively identified. The associated numerical result is an estimate.

UJ The analyte was not detected at or above the reported estimated result.

Appendix F - (cont'd) - Olympus Terrace, October 1995.

Location:	Inf-E	Eff-E	Sludge
Type:	comp	comp	grab
Date:	10/18-19	10/18-19	10/18
Time:	0800-0800	0800-0800	1400
Lab Log#:	428246	428248	428245
BNA Compounds	ug/L	ug/L	ug/Kg-dry
Benzo(a)Pyrene	0.53 U	0.52 U	582 U
2,4-Dinitrophenol	11 UJ	11 UJ	11600 UJ
Dibenzo(a,h)Anthracene	0.53 U	0.52 U	582 U
Benzo(a)Anthracene	0.53 U	0.52 U	582 U
4-Chloro-3-Methylphenol	0.53 U	0.52 U	582 U
Aniline	0.53 U	0.52 U	582 U
Benzoic Acid	11 UJ	5.9 J	7230 J
Hexachloroethane	0.53 U	0.52 U	582 U
Hexachlorocyclopentadiene	5.3 U	5.2 U	5820 U
Isophorone	0.53 U	0.44 J	582 U
Acenaphthene	0.53 U	0.52 U	582 U
Diethyl Phthalate	9	0.52 UJ	392 J
Di-n-Butyl Phthalate	3.3	0.52 U	582 U
Phenanthrene	0.21 J	1 U	1160 U
Butylbenzyl Phthalate	4 J	5.2 U	1220 J
N-Nitrosodiphenylamine	0.53 U	0.52 U	582 U
Fluorene	0.53 U	0.52 U	582 U
Carbazole	0.53 U	0.52 U	582 U
Hexachlorobutadiene	0.53 U	0.52 U	582 U
Pentachlorophenol	5.3 U	5.2 U	5820 U
2,4,6-Trichlorophenol	0.53 U	0.52 U	582 U
2-Nitroaniline	11 U	11 U	11600 U
2-Nitrophenol	5.3 U	5.2 U	5820 U
Naphthalene	0.53 U	0.52 U	582 U
2-Methylnaphthalene	0.53 U	0.52 U	582 U
2-Chloronaphthalene	0.53 U	0.52 U	582 U
3,3'-Dichlorobenzidine	5.3 U	5.2 U	5820 U
Benzidine	5.3 U	5.2 U	5820 U
2-Methylphenol	0.53 U	0.52 U	582 U
1,2-Dichlorobenzene	0.53 U	0.52 U	582 U
2,4,5-Trichlorophenol	0.53 U	0.52 U	582 U
Nitrobenzene	0.53 U	0.52 U	582 U
3-Nitroaniline	5.3 U	5.2 U	5820 U
4-Nitroaniline	5.3 U	5.2 U	5820 U
4-Nitrophenol	2.7 U	2.6 U	2910 U
Benzyl Alcohol	2.6	0.52 U	582 UJ
4-Bromophenyl Phenylether	0.53 U	0.52 U	582 U
2,4-Dimethylphenol	0.53 U	0.52 U	582 U
4-Methylphenol	0.53 U	0.84	15100
1,4-Dichlorobenzene	0.56	0.52 U	582 U
4-Chloroaniline	0.53 U	0.52 U	582 U
Phenol	0.81	0.63	596 U
Pyridine	1.1 UJ	1 UJ	1160 U
Bis(2-Chloroethyl)Ether	0.53 U	0.52 U	582 U
Bis(2-Chloroethoxy)Methane	0.53 U	0.52 U	582 U

U The analyte was not detected at or above the reported result.

J The analyte was positively identified. The associated numerical result is an estimate.

UJ The analyte was not detected at or above the reported estimated result.

Appendix F - (cont'd) - Olympus Terrace, October 1995.

	Inf-E	Eff-E	Sludge
	comp	comp	grab
	10/18-19	10/18-19	10/18
	0800-0800	0800-0800	1400
	428246	428248	428245
BNA Compounds - (cont'd)	ug/L	ug/L	ug/Kg-dry
Bis(2-Ethylhexyl)Phthalate	**21**	0.52 UJ	**8320**
Di-n-Octyl Phthalate	5.3 UJ	5.2 UJ	5820 U
Hexachlorobenzene	0.53 U	0.52 U	582 U
Anthracene	0.53 U	0.52 U	582 U
1,2,4-Trichlorobenzene	0.53 U	0.52 U	582 U
2,4-Dichlorophenol	0.53 U	0.52 U	582 U
2,4-Dinitrotoluene	11 U	11 U	11600 U
1,2-Diphenylhydrazine	0.53 U	0.52 U	582 U
Pyrene	0.53 U	0.52 U	582 U
Dimethyl Phthalate	**0.5 J**	0.52 U	**578 J**
Dibenzofuran	0.53 U	0.52 U	582 U
Benzo(g,h,i)Perylene	0.53 U	0.52 U	582 U
Indeno(1,2,3-cd)Pyrene	0.53 U	0.52 U	582 U
Benzo(b)Fluoranthene	0.53 U	0.52 U	582 U
Fluoranthene	0.53 U	0.52 U	582 U
Benzo(k)Fluoranthene	0.53 U	0.52 U	582 U
Acenaphthylene	0.53 U	0.52 U	582 U
Chrysene	0.53 U	0.52 U	582 U
4,6-Dinitro-2-Methylphenol	5.3 UJ	5.2 UJ	582 U
1,3-Dichlorobenzene	0.53 U	0.52 U	582 U
2,6-Dinitrotoluene	11 U	11 U	11600 U
N Nitroso-di-n-Propylamine	0.53 U	0.52 U	582 U
4-Chlorophenyl Phenylether	0.53 U	0.52 U	582 U
N Nitrosodimethylamine	2.7 U	2.6 U	2910 U
Caffeine	**62**	**0.14 J**	582 U
3B-Coprostanol	**399 E**	**10 J**	**111000**
Retene	0.53 U	0.52 U	582 U
Bis(2-Chloroisopropyl)Ether	0.53 U	0.52 U	582 U
2-Chlorophenol	0.53 U	0.52 U	582 U

U The analyte was not detected at or above the reported result.

J The analyte was positively identified. The associated numerical result is an estimate.

UJ The analyte was not detected at or above the reported estimated result.

E The concentration of the associated value exceeded the known calibration range.

Appendix F - (cont'd) - Olympus Terrace, October 1995.

Location:		Inf-E	Eff-E	Sludge
Type:		comp	comp	grab
Date:		10/18-19	10/18-19	10/18
Time:		0800-0800	0800-0800	1400
Lab Log#:		428246	428248	428245
Pesticide/PCB Compounds		ug/L	ug/L	ug/Kg-dry
alpha-BHC	U	0.033 U	0.0033 U	29 U
beta-BHC	U	0.033 U	0.0033 U	29 U
delta-BHC	U	0.033 U	0.0033 U	29 U
gamma-BHC (Lindane)	U	**0.014 J**	**0.012**	29 U
Heptachlor	U	0.033 U	0.0033 U	29 U
Aldrin	U	0.033 U	0.0033 U	29 U
Heptachlor Epoxide	U	0.003 U	0.0033 U	29 U
Endosulfan I	U	0.033 U	0.0033 U	29 U
Dieldrin	U	0.033 U	0.0033 U	29 U
4,4'-DDE	U	0.033 U	0.0033 U	29 U
Endrin	U	0.033 U	0.0033 U	29 U
Endosulfan II	U	0.033 U	0.0033 U	29 U
4,4'-DDD	U	0.033 U	0.0033 U	**110 NJ**
Endosulfan Sulfate	U	0.033 U	0.0033 U	29 U
4,4'-DDT	U	0.03 U	0.0033 U	29 U
Methoxychlor	U	0.033 U	0.0033 U	**93 NJ**
Endrin Ketone	U	0.033 U	0.0033 U	29 U
alpha-Chlordane	U			
gamma-Chlordane	U			
Toxaphene	U	0.1 U	0.098 U	870 U
Aroclor-1016	U	0.033 U	0.033 U	290 U
Aroclor-1221	U	0.033 U	0.033 U	290 U
Aroclor-1232	U	0.033 U	0.033 U	290 U
Aroclor-1242	U	0.033 U	0.033 U	290 U
Aroclor-1248	U	0.033 U	0.033 U	290 U
Aroclor-1254	U	0.033 U	0.033 U	290 U
Aroclor-1260	U	0.033 U	0.033 U	290 U
Endrin Aldehyde	U	0.033 U	0.0033 U	29 U
Chlordane	U	0.033 U	0.033 U	290 U

U The analyte was not detected at or above the reported result.

J The analyte was positively identified. The associated numerical result is an estimate.

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

Appendix F - (cont'd) - Olympus Terrace, October 1995.

Location:	Inf-E	Eff-E	TrnsblkO	Trnsblk2	ProdPlat	TRAMCO	TrnsblkP	TrnsblkT	Sludge	State Water Quality Criteria Summary	
Type:	comp	comp	grab	grab	comp	comp	grab	grab	grab		
Date:	10/18-19	10/18-19	10/17	10/17	10/16-17	10/17	10/16	10/16	10/18	Acute	Chronic
Time:	0800-0800	800-0800	1100	1105	400-1400	800-1530	1355	1530	1400	Marine	Marine
Lab Log #:	428246	428246	428234	428235	428230	428232	428231	428233	428245		
	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/Kg-dry	ug/L	ug/L
Metals + +	Total-Recov.	tal-Recov.	Total-Recov.	Total-Recov.	Total	Total	Total	Total	Total		
Antimony	30 U	30 U	30 U	30 U	30 U	30 U	30 U	30 U	7.4		
Arsenic	1.8	1.5 U	1.5 U	1.5 U	2.5	1.5 U	1.5 U	1.5 U	2.8		
Pentavalent										2,319 *	13 *
Trivalent										69	36.00
Beryllium	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.14		
Cadmium	4.96	0.82	0.30	0.94	13.6	21.7	0.1 U	0.1 U	7.8	37.20	8.0000
Chromium											
Total recoverable	7.2	5 U	5 U	5 U							
Total					256 J	16 J	5 U	5 U	205		
Hexavalent										1,100	50
Trivalent										10,300 *	
Copper	49.4	11	4 U	4 U	160	12	6 U	6 U	438	3	
Lead	8.4	1.6	1 U	8.0	15.1	1 U	1 U	1 U	63.5	151	6
Mercury (Total)	0.16	0.10	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.05 UJ	0.682 J	2	0
Nickel	10 U	10 U	10 U	10 U	64	15	10 U	10 U	68.5	71	8
Selenium	2 U	2 U	2 U	2 U	2 UJ	2 UJ	2 UJ	2 UJ	7.88	300	71
Silver	19.9	0.83	0.5 U	0.5 U	1.3	0.5 U	0.5 U	0.5 U	155	1.2	
Thallium	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	0.5 U	2,130 *	
Zinc	401	64.5	4.6	4.3	769	23	11	11	598	85	77

'NOTE: SOME INDIVIDUAL COMPOUND CRITERIA OR LOELS MAY NOT AGREE WITH GROUP CRITERIA OR LOELS.

REFER TO APPROPRIATE EPA DOCUMENT ON AMBIENT WATER QUALITY CRITERIA FOR FULL DISCUSSION.

U The analyte was not detected at or above the reported result.

UJ The analyte was not detected at or above the reported estimated result.

Appendix F - (cont'd) - Olympus Terrace, October 1995.

Location:	Eff-E
Type:	comp
Date:	10/18-19
Time:	0800-0800
Lab Log#:	428248

Phenols-Guaiacols -Catechols	ug/L
Phenol	1.3 U
4-Chlorophenol	0.67 U
2-Chlorophenol	1.3 U
2-4-Dimethylphenol	1.3 U
2-6-Dichlorophenol	1.3 U
2-4-Dichlorophenol	1.3 U
4-Chloroguaiacol	0.67 U
2,4,6-Trichlorophenol	1.3 U
4-Chlorocatechol	0.67 U
4,6-Dichloroguaiacol (Ac)	1.3 U
3,4Dichloroguaiacol	1.3 U
4,5 Dichloroguaiacol	1.3 U
3,6-Dichlorocatechol (Ac)	1.3 U
2,3,4,6-Tetrachlorophenol	0.67 U
5-Chlorovanillin (Ac)	1.3 U
6-Chlorovanillin	1.3 U
3,4-Dichlorocatechol (Ac)	1.3 U
3,4,6-Trichloroguaiacol (Ac)	0.61 U
3,4,5-Trichloroguaiacol (Ac)	1.3 U
4,5-Dichlorocatechol	1.3 U
4,5,6-Trichloroguaiacol	1.3 U
3,4,6-Trichlorocatechol (Ac)	2.7 U
5,6-Dichlorovanillin	1.3 U
2-Chlorosyringaldehyde (Ac)	1.3 U
3,4,5-Trichlorocatechol	2.7 U
Pentachlorophenol	1.3 U
Tetrachloroguaiacol	2.7 U
Trichlorosyringol	1.3 U
Tetrachlorocatechol	2.7 U
2,6-Dichlorosyringaldehyde	1.3 U

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

Appendix G – VOA and BNA Scan Tentatively Identified Compounds (TICs)– Olympus Terrace, October 1995.

TIC data are presented on the laboratory report sheets that follow. Fractions are identified as volatile organics (VOAs) or semivolatile organics (BNAs). No VOA TICs are available for effluent samples. Locations corresponding to the Lab Log # (called Sample No. on the laboratory report sheet and data qualifiers are summarized on this page.

Location:	Inf–1	Inf–2	Inf–E	Eff–E	Sludge
Type:	grab	grab	comp	comp	grab
Date:	10/18	10/18	10/18–19	10/18–19	10/18
Time:	1045	1350	0800–0800	0800–0800	1400
Lab Log #:	428236	428237	428246	428247	428245

Inf – influent sample
Eff – effluent sample
Sludge – sludge sample

grab – grab sample
comp – composite sample
E – Ecology sample

NJ – There is evidence that the analyte is present. The associated numerical result is an estimate.

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Volatile Organic Analysis

Project Name: Olympus Terrace Class II **LIMS Project ID:** 2255-95

Sample: 95428236 **Date Received:** 10/19/95 **Method:** SW8260
Field ID: INF-1 **Matrix:** Water
Project Officer: S. Golding **Date Analyzed:** 11/01/95 **Units:** ug/L

Tentatively Identified Compounds

CAS Number	Analyte Description	Result	Qualifier
620144	*Benzene, 1-Ethyl-3-Methyl-*	.62	NJ
464175	*Bicyclo[2.2.1]Hept-2-Ene, 1,7,7-Trimethyl-*	8.7	NJ
934747	*Benzene, 1-Ethyl-3,5-Dimethyl-*	.65	NJ
470826	*Cineole (Van)*	1.2	NJ
471841	*Bicyclo[2.2.1]heptane, 7,7-dimethyl-2-me*	.65	NJ
1124250	*Cyclohexane, 1-methyl-4-(1-methylethenyl*	1.2	NJ

Authorized By: _____ Release Date: 11/6/96

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Volatile Organic Analysis

Project Name: Olympus Terrace Class II **LIMS Project ID:** 2255-95

Sample: 95428237 **Date Received:** 10/19/95 **Method:** SW8260
Field ID: INF-2 **Matrix:** Water
Project Officer: S. Golding **Date Analyzed:** 11/01/95 **Units:** ug/L

Tentatively Identified Compounds

CAS Number	Analyte Description	Result	Qualifier
67630	*Isopropyl Alcohol*	8.6	NJ
106354	*3-Heptanone*	1.2	NJ
562743	*3-Cyclohexen-1-Ol, 4-Methyl-1-(1-Methylethyl)-*	9.1	NJ
464175	*Bicyclo[2.2.1]Hept-2-Ene, 1,7,7-Trimethyl-*	2.8	NJ
470826	*Cineole (Van)*	11	NJ
1678973	*Cyclohexane, 1,2,3-Trimethyl-*	1.3	NJ
589333	*1H-Pyrrole, 1-butyl-*	2.1	NJ
499036	*Cyclohexene, 1-methyl-3-(1-methylethenyl*	1.3	NJ
89781	*Cyclohexanol, 5-Methyl-2-(1-Methylethyl)-, (1.Alpha.,2*	2.9	NJ
53282476	*Bicyclo[4.1.0]heptane, 7-(1-methylethyli*	1.1	NJ

Authorized By: D. Norton Release Date: 1/16/96

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Volatile Organic Analysis

Project Name: Olympus Terrace Class II **LIMS Project ID:** 2255-95

Sample: 95428245 **Date Received:** 10/19/95 **Method:** SW8260
Field ID: SLUDGE **Matrix:** Semi-Solid/Sludge
Project Officer: S. Golding **Date Analyzed:** 11/17/95 **Units:** ug/Kg Dry Wt.

Tentatively Identified Compounds

CAS Number	Analyte Description	Result	Qualifier
75183	*Methane, Thiobis*	19	NJ
624920	*Disulfide, Dimethyl*	12	NJ
29548025	*1,3,6-Heptatriene, 2,5,5-Trimethyl-*	14	NJ
31081182	*Nonane, 3-Methyl-5 Propyl*	14	NJ
62108252	*Decane, 2,6,7-Trimethyl-*	12	NJ

Authorized By: D Hunter Release Date: 11/16/95 Page: 3

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Base/Neutral/Acids

Project Name: Olympus Terrace Class II **LIMS Project ID:** 2255-95

Sample: 95428246 **Date Received:** 10/20/95 **Method:** SW8270
Field ID: INF-E **Date Prepared:** 10/23/95 **Matrix:** Water
Project Officer: S. Golding **Date Analyzed:** 10/27/95 **Units:** ug/L

Tentatively Identified Compounds

CAS Number	Analyte Description	Result	Qualifier
107937	*2-Butenoic acid, (E)-*	189	NJ
13201462	*2-Butenoic acid, 2-methyl*	15	NJ
20324327	*2-Propanol, 1-(2-Methoxy-1-Methylethoxy)-*	10	NJ
98555	*3-Cyclohexene-1-Methanol, .Alpha.,.Alpha.4-Trimethyl-*	22	NJ
*3008001	*Unknown 01*	11	NJ
*3008002	*Unknown 02*	458	NJ
*3008003	*Unknown 03*	14	NJ
*3008004	*Unknown 04*	42	NJ
143077	*Decanoic Acid, Di-*	43	NJ
126738	*Phosphoric Acid Tributyl Ester*	29	NJ
*3008005	*Unknown 05*	52	NJ
1002842	*Decanoic Acid, Penta-*	44	NJ
*3008006	*Unknown 06*	51	NJ
*3008007	*Unknown 07*	20	NJ
57103	*Hexadecanoic Acid*	1310	NJ
*3008008	*Unknown 08*	45	NJ
13481953	*10-Octadecenoic Acid, Methyl Ester*	2440	NJ
57114	*Octadecanoic Acid*	1280	NJ
*300809	*Unknown 09*	179	NJ
*3008010	*Unknown 10*	35	NJ
57885	*Cholesterol*	396	NJ
*3008011	*Unknown 11*	59	NJ
*3008012	*Unknown 12*	116	NJ
*3008013	*Unknown 13*	186	NJ

Authorized By: _____ Release Date: 11-14-95

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Base/Neutral/Acids

Project Name: Olympus Terrace Class II **LIMS Project ID:** 2255-95

Sample: 95428248 **Date Received:** 10/20/95 **Method:** SW8270
Field ID: EFF-E **Date Prepared:** 10/23/95 **Matrix:** Water
Project Officer: S. Golding **Date Analyzed:** 10/27/95 **Units:** ug/L

Tentatively Identified Compounds

CAS Number	Analyte Description	Result	Qualifier
20324327	*2-Propanol, 1-(2-Methoxy-1-Methylethoxy)-*	2.2	NJ
*3008001	*Unknown 01*	2.5	NJ
112345	*Ethanol, 2-(2-Butoxyethoxy)-*	33	NJ
*3008002	*Unknown 02*	6.2	NJ
124174	*Ethanol, 2-(2-Butoxyethoxy)-, Acetate*	170	NJ
*3008003	*Unknown 03*	3.7	NJ
*3008004	*Unknown 04*	3.3	NJ
143077	*Decanoic Acid, Di-*	1.1	NJ
126738	*Phosphoric Acid Tributyl Ester*	11	NJ
544638	*Decanoic Acid, Tetra-*	1.8	NJ
*3008005	*Unknown 05*	2.4	NJ
*3008006	*Unknown 06*	5.7	NJ
*3008007	*Unknown 07*	1.1	NJ
*3008008	*Unknown 08*	3.2	NJ
112801	*Oleic Acid*	12	NJ
57114	*Octadecanoic Acid*	8.6	NJ
103231	*Hexanedioic Acid, Bis(2-Ethylhexyl) Ester*	2.8	NJ

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Base/Neutral/Acids

Project Name: Olympus Terrace Class II **LIMS Project ID:** 2255-95

Sample: 95428245 **Date Received:** 10/19/95 **Method:** SW8270
Field ID: SLUDGE **Date Prepared:** 10/24/95 **Matrix:** Semi-Solid/Sludge
Project Officer: S. Golding **Date Analyzed:** 11/15/95 **Units:** ug/Kg Dry Wt.

Tentatively Identified Compounds

CAS Number	Analyte Description	Result	Qualifier
*3008011	*Unknown 11*	34600	NJ
*3008012	*Unknown 12*	61100	NJ
1576870	*2-Pentenal, (E)-*	29700	NJ
25414226	*Furan, 2-methoxy*	264000	NJ
116530	*Butanoic Acid, 2-Methyl-*	95300	NJ
646071	*Pentanoic Acid, 4-Methyl-*	39500	NJ
626539	*2,4,6-Heptanetrione*	13700	NJ
1123097	*2-Cyclohexen-1-One, 3,5-Dimethyl-*	71900	NJ
*3008001	*Unknown 01*	11200	NJ
*3008002	*Unknown 02*	9490	NJ
*3008003	*Unknown 03*	13300	NJ
544638	*Decanoic Acid, Tetra-*	31800	NJ
*3008004	*Unknown 04*	15300	NJ
1002842	*Decanoic Acid, Penta-*	78400	NJ
*3008005	*Unknown 05*	18300	NJ
*3008006	*Unknown 06*	12200	NJ
56875673	*7-Hexadecenoic acid, methyl*	9680	NJ
112390	*Decanoic Acid, Methyl Ester Hexa-*	12600	NJ
2091294	*9-Hexadecenoic Acid*	328000	NJ
*3008007	*Unknown 07*	24400	NJ
112801	*Oleic Acid*	303000	NJ
57114	*Octadecanoic Acid*	134000	NJ
*3008010	*Unknown 10*	108000	NJ
*3008008	*Unknown 08*	57100	NJ
*3008009	*Unknown 09*	82100	NJ

Authorized By: D. Hanten Release Date: 12/11/95

Appendix H - Glossary of Terms - Olympus Terrace, October 1995.

BOD_5 - five day biochemical oxygen demand
BNA - base-neutral acid extractables (semivolatile organics)
comp - composite sample
D.O. - dissolved oxygen
est. - estimated concentration
E - Department of Ecology
Eff - effluent
EPA - United States Environmental Protection Agency
F-coli - fecal coliform bacteria
g - gram
grab - grab sample
Inf - influent
MF - membrane filter
mg - milligram
MGD - million gallons per day
mg/L - milligram per liter
NPDES - National Pollutant Discharge Elimination System
O - Olympus Terrace
OT - Olympus Terrace
P - Production Plating, Inc.
pH - $-\log_{10}$ (hydrogen ion concentration)
QA - quality assurance
QC - quality control
T - TRAMCO
TIC - tentatively identified compound
TNVS - total nonvolatile solids
TNVSS - total nonvolatile suspended solids
TOC - total organic carbon
TS - total solids
TSS - total suspended solids
µg - microgram
VOA - volatile organic analysis