

# City of Marysville Wastewater Treatment Plant Class II Inspection

January 1997

Publication No. 97-304

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# City of Marysville Wastewater Treatment Plant Class II Inspection

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January 1997

Water Body No. WA-07-1010

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# **Abstract**

An announced Class II inspection was conducted March 3-6, 1996 at the City of Marysville Wastewater Treatment Plant (Marysville) in Snohomish County, Washington. Included were analyses of three industrial contributors to the Marysville collection system: National Foods Corporation, Pacific Coast Feathers Company, and Quil Ceda Tanning Company.

Moderate reductions in BOD<sub>5</sub>, CBOD<sub>5</sub>, TOC, and TSS occurred across the treatment plant, but calculations suggest that more robust removal efficiencies are theoretically possible. Effluent ammonia concentration was relatively high, but was not expected to exceed water quality criteria at the edge of the acute mixing zone. Analysis of the facility's complete mix aeration cells determined that aeration met minimum oxygenation requirements, but was inadequate for mixing. Marysville should investigate the impact of mixing on treatment effectiveness. Calculations suggest that the current recirculation rate to the first and second oxidation ponds from the fourth lagoon may not be highly effective in reducing BOD<sub>5</sub>. Detention time across the two oxidation ponds appears to be adequate and sludge buildup was minimal. BOD<sub>5</sub> and TSS concentrations increased across the third and fourth stabilization ponds, and this is likely due to algae growth. The in-plant sand filter appeared to be operating effectively.

The 24-hour effluent composite CBOD<sub>5</sub> concentration exceeded the NPDES permit weekly and monthly average limits. Although the comparison is based upon a single sample, Marysville should ensure that the plant does not on average exceed these limits. TSS was 80% of the weekly limit and Marysville should ensure that the limit is not exceeded during seasons when greater algae growth may occur. The Pacific Coast Feathers BOD<sub>5</sub> grab sample and Quil Ceda Tanning BOD<sub>5</sub> 24-hour composite sample concentrations exceeded state waste discharge permit daily maximum limits. National Foods 24-hour composite pH measurement also exceeded the state waste discharge permit limit. The dischargers should ensure that effluents concentrations are within permit limits. Contributions of toxic loads to the Marysville treatment plant influent were generally low.

The Marysville whole effluent copper concentration exceeded water quality criteria, but is expected to be reduced to below criteria within the dilution zone. The Marysville effluent chronic fathead minnow bioassay indicated toxicity at low concentrations, and a reasonable potential exists for chronic conditions in the receiving water. Additional bioassays, including bioassays for marine organisms, are recommended. Effluent CBOD<sub>5</sub> and BOD<sub>5</sub> results differed substantially for Ecology and Marysville split samples and it is recommended that Marysville review holding procedures. Marysville sludge concentrations do not exceed limits for land application or hazardous waste designation.

# Summary

#### Flow Measurements

Daily 24-hour influent flow reported by Marysville was 3.95 MGD during the period of the 24-hour composites and averaged 4.03 MGD during the inspection. Effluent flow was 3.83 MGD during the period of the 24-hour composites and averaged 3.84 MGD. The inaccessibility of influent Parshall flume and effluent weir precluded independent verification of flow measurements. The apparent losses across the treatment system may be due to non-steady state flows, evaporation, lagoon liner leakage, or inaccurate flow measurements. Flow through the sand filters was estimated to be 1.24 MGD. 2.6 MGD of unfiltered wastewater (68% of total) was combined with the filtered flow before final discharge. Recirculation flow from the fourth lagoon (12.96 MGD) was combined with backwash reject from the sand filters (216,000 gal/day) and returned to the first lagoon. Daily discharge to the collection system from National Foods, Inc., Quil Ceda, and Pacific Coast Feathers were 41,040 gal/day, 10,300 gal/day, and 52,783 gal/day respectively.

# Wastewater General Chemistry and Treatment Plant Design

#### Treatment Plant Influent

Influent concentrations of Total Solids (TS - 528 mg/L), Total Suspended Solids (TSS - 191 mg/L), and ammonia nitrogen (NH<sub>3</sub>-N - 18 mg/L) were slightly less than the typical medium concentrations for untreated domestic wastewater. The five-day Biochemical Oxygen Demand (BOD<sub>5</sub> 262 mg/L) was 19% greater and the BOD<sub>5</sub>/TOC ratio (2.83) about two times greater than typical medium values. The data suggests that, as compared to typical domestic influents, biologically inactive organic carbon compounds were scarce in the Marysville influent and that this should result in better relative effluent quality.

#### Aeration Cell Effluent

Reduction in total BOD<sub>5</sub> across the aeration cells was 52%. TSS concentration decreased from 191 mg/L to 80 mg/L. Aeration in the cell appears to be suitable for oxygen requirements, but inadequate for mixing. The reaction rate coefficient ( $k_1$ ) for the cells due to respiration alone was approximately 0.85 d<sup>-1</sup> (to the base e at 20° C), and was within typical values. A rough estimate of  $k_1$  with settling included was approximately 1.3 d<sup>-1</sup> (20° C). The value is greater than the minimum  $k_1$  (0.6 d<sup>-1</sup> at 20° C) required by Ecology design standards for complete mix lagoon systems to ensure full treatment of

domestic sewage. TSS concentration across the aeration cells was reduced 58% in contrast to a predicted increase of about 40%. It is likely considerable settling was taking place.

#### Oxidation Lagoon #2 Effluent

Reductions in total  $BOD_5$  across oxidation ponds #1 and #2 exceeded 67%. The calculated theoretical effluent  $BOD_5$  result (26.4 mg/L) was 36% less than the measured  $BOD_5$  (41 mg/L) result. There is a question about the efficacy of recirculation in reducing  $BOD_5$  loads. The TSS influent concentration (54 mg/L) decreased 33% across the two-lagoon system. Overflow rate was 11 gal/ft<sup>2</sup>·d and the solids loading per unit area was  $2.7 \times 10^{-4}$  lb/ ft<sup>2</sup>·h. Detention time (4.1 days) was greater than recommended minimums for settling after aerated lagoon treatment systems. The sludge accumulation rate was approximately 0.03 inches/year equally distributed.

#### Stabilization Lagoon #4 Effluent

The reported effluent total BOD<sub>5</sub> concentration for lagoon #4 effluent was 29 mg/L, but this value is suspect. The reason for the anomalous total BOD<sub>5</sub> result is unknown. Lagoon #4 effluent total BOD<sub>5</sub> concentration was calculated from a mass balance of filter effluent load and final effluent load and found to be approximately 65.4 mg/L. For the purposes of this report the calculated value was used. Total BOD<sub>5</sub> across polishing lagoons #3 and #4 increased about 60%, an increase that is most likely due to algae growth. A predicted reduction in BOD<sub>5</sub> was calculated to be between 65% to 80%. TSS also increased 17%, which is also consistent with the growth of algae. Lagoon overflow rate (10.5 gal/ft²·d) and sludge loading (2.3 x 10<sup>-4</sup> lb/ ft²·h) were well within typical values. It is reasonable to expect that the sludge accumulation rate would be consistent with that in lagoons #1 and #2.

#### Sand Filter Effluent

Filtration across the sand filter achieved reductions of 65% in TSS, 59% in total BOD<sub>5</sub>, and 20% in soluble BOD<sub>5</sub> as well as reductions in ammonia nitrogen, Kjeldahl nitrogen, and total phosphorus. This resulted in overall reductions in the final effluent of 18% for TSS, 36% for total BOD<sub>5</sub>, and 5.4% for soluble BOD<sub>5</sub>. There was also an increase of nitrate and nitrite nitrogen.

#### Treatment Plant Effluent

Ecology results showed a total BOD<sub>5</sub> reduction from 262 mg/L in the influent to 53 mg/L in the effluent for 80% removal. Total suspended solids (TSS) decreased from 191 mg/L to 47 mg/L, for 76% removal efficiency. Carbonaceous BOD<sub>5</sub> showed a 75% reduction. TOC, Kjeldahl nitrogen, ammonia nitrogen, and total phosphorous were reduced 59%, 29%, 19%, and 40% respectively. Nitrate and nitrite nitrogen increased 11.7%, an

increase that appeared to take place largely in the sand filter. Chlorine residual concentrations in all samples were less than the detection limit. Permitted mixing zone dilution factors are 8.8 and 17 for acute and chronic zones respectively. A mass balance calculation showed adequate dilution at the acute and chronic dilution zone boundaries.

# Industrial Contributor Discharge Results and State Permit Comparisons

#### National Foods Corporation

The Ecology composite sample pH result for National Foods discharge was 11.92. This exceeds the state discharge permit pH range limit. The inspection result did not exceed specific dangerous waste corrosivity limits, but was sufficiently close to warrant attention. The Ecology total BOD<sub>5</sub> composite result was equal to or greater than 820 mg/L, and at the minimum value within the interim effluent limit. The reported value exceeds the new final effluent BOD<sub>5</sub> limit (effective date: July 1). The Ecology TSS composite result was well within interim and final effluent limits. The discharge's contribution to the Marysville treatment plant influent represents about:

- $\geq$ 3% of the BOD<sub>5</sub> load,
- $\geq$ 2% of the CBOD<sub>5</sub> load,
- 7% of the TOC load,
- 1% of the phosphorus load.

## Pacific Coast Feathers Company

The Ecology BOD<sub>5</sub> grab-composite sample result (318 mg/L) for the Pacific Coast Feathers discharge exceeded the state waste discharge permit daily maximum limit. Ecology TSS result was about 80 % of the permit limit. TOC, oil & grease, and ammonia nitrogen results were 353 mg/L, 55 mg/L, and 15 mg/L respectively. The discharge's contribution to the Marysville treatment plant influent represents about:

- 1.5% of the total BOD<sub>5</sub> load,
- 10% of its TOC load,
- 2% of the TSS load,
- 4% of the oil & grease load,
- slightly more than 1% of its ammonia nitrogen load.

#### Quil Ceda Tanning Company

The Ecology BOD<sub>5</sub> composite sample result (373 mg/L) for Quil Ceda Tanning discharge exceeded the state waste permit daily maximum by 24%. TSS, oil & grease results, and sulfide results were well within state permit limits. The discharge's contribution to the Marysville treatment plant influent represents about:

- less than 1% of the total BOD<sub>5</sub> load,
- less than 0.1% of the TSS load
- 1.4% of the ammonia nitrogen load,
- 2.0% of the Kjeldahl nitrogen load,
- less than 0.1% of the oil & grease load,

# **NPDES Permit Comparisons**

The lagoon #4 effluent 24-hour composite TSS concentration (60.1 mg/L) and load (1403 lb/day), as modified to reflect portions of the effluent below 2.8 MGD, were within NPDES permit monthly and weekly average limits. The TSS concentration (22 mg/L) and load (194 lb/day) for the filtered portion exceeding 2.8 MGD were also within permit monthly and weekly average limits. Percent reduction from the influent concentration for the portion that exceeded 2.8 MGD (89%) was greater than the 85% minimum monthly average reduction required by the permit.

The Ecology composite 24-hour effluent CBOD<sub>5</sub> concentration (48 mg/L) exceeded the permit monthly average limit by 92% and the weekly average limit by 20%. The effluent 24-hour composite CBOD<sub>5</sub> load (1533 lb/day) exceeded NPDES permit monthly average effluent load limits by 21%, but was within the weekly average load limit. The percent reduction from the influent concentration (75%) was less than the minimum monthly average reduction (85%) required by the permit. All other parameters were within permit influent design loads and effluents limits.

# **Detected Priority Pollutant Organics and Metals**

# Marysville Treatment Plant

VOA compounds and BNA compounds results did not exceed either freshwater or marine acute and chronic water quality criteria. One priority pollutant metal, copper ( $10 \mu g/L$ ), exceeded the marine acute water quality criteria ( $2.5 \mu g/L$ ) in the whole effluent. Dilution in the receiving water (acute dilution factor: 8.8) should reduce this concentration to less than 46% of the acute criteria.

#### Quil Ceda

A single VOA compound, acetone, was detected in two Quil Ceda effluent grab samples, one at  $52,700~\mu g/L$  and the other at  $58,800~\mu g/L$ . Total discharge load was approximately 5.1~lbs/day. This load should have produced a concentration in the treatment plant influent of about  $150~\mu g/L$ , but it apparently volatilized in the collection system. One BNA compound, benzoic acid ( $122~\mu g/L$ ), was discharged at an appreciable concentration. Four metals were detected in the Quil Ceda discharge, but the highest concentration, chromium ( $515~\mu g/L$ ), was calculated to contribute about 14% to the Marysville treatment plant influent chromium load (0.329~lbs/day).

# **Effluent Bioassays**

The *Daphnia magna* acute 48-hour survival test found 100% survival at all concentrations in the dilution series, except at 100% effluent which produced a 5% mortality. Statistical analysis determined that the Lowest Observable Effective Concentration (LOEC) and the No Observable Effective Concentration (NOEC) were both greater than 100%.

The fathead minnow (*Pimephales promelas*) chronic 7-day survival and growth test produced a survival analysis with an LC50 of 57.8%, LOEC of 25.0%, and NOEC of 12.5%. The growth analysis found a LOEC of 12.5%, NOEC of 6.25%, and 25/50% growth inhibition concentration (Icp) of 10.5%. This represents a statistically significant difference in response at a concentration less than the acute critical effluent concentration. A reasonable potential exists for chronic toxicity in the receiving water.

# **Split Samples**

# Sample Comparisons

Relative percent differences (RPD) between pairs of BOD<sub>5</sub> and pH samples were less than variation in precision cited in the EPA comparison of interlaboratory analysis of selected parameters (EPA, March 1983). The RPD between influent TSS values is close to four times the interlaboratory variation in precision, which suggests that there was a difference between Ecology and Marysville composite sampling technique. This may be due to inadequate mixing when dividing the sample in preparation for analysis. Ecology BOD<sub>5</sub> and CBOD<sub>5</sub> results for Ecology and Marysville effluent samples were divergent, with a RPD of 65% and 100% respectively. This may be the result of an elevated holding temperature for the Marysville sample.

#### Laboratory Comparisons

Ecology and Marysville laboratory results for influent samples collected by both Ecology and Marysville were well matched, indicating that the Marysville laboratory performance was good.

# Sludge

#### General Chemistry

Total Kjeldahl nitrogen in the sludge was about 1972 mg/L wet weight. Total accumulated sludge was about  $3.94 \times 10^5$  lbs of nitrogen. For sustainable nutrient uptake rates during land application this would require a minimum of at least 820 acres applied over one year.

The sludge dry weight fecal coliform density was 149 colonies per grams (1700 #/100g -wet wt.) and was less than the maximum limit for fecal coliform density of 1000 #/g dry wt. required for Class A sewage sludge land application (EPA, 1993).

#### **Detected Priority Pollutants**

Five VOAs and eight BNAs were detected in the composite sludge sample. One BNA, 3B-coprostanol, was detected at 97,500 µg/Kg-dry wt. Eleven metals were detected in the sludge. Copper, lead, and chromium concentrations (234, 139, and 254 mg/Kg-dry wt. respectively) appear to reflect the removal over time of relatively high influent concentrations. The concentrations of priority pollutants in the sludge did not exceed either EPA standards for land application of sewage sludge or screening concentrations for the dangerous waste designation criteria. Chromium and lead approached 30% and 16% of the dangerous waste screening concentration (20 times maximum leachate extract toxicity limit).

# Recommendations

# **General Chemistry and Plant Design**

- Marysville should independently verify the accuracy of influent and effluent flow meters.
- Marysville should determine if increased mixing in the aeration cells will improve treatment efficiency.
- Marysville should test treatment efficiency with reduced recirculation to determine if recirculation rate could be reduced or the practice discontinued entirely.

# Industrial Contributor Discharge Results and State Permit Comparisons

- National Foods should reduce discharge pH to meet the permit limit.
- Pacific Coast Feathers should reduce daily BOD<sub>5</sub> to within the permit limit.
- Quil Ceda should reduce BOD<sub>5</sub> concentrations to within the permit limits.

# **NPDES Permit Comparisons**

- Marysville should ensure that TSS concentrations and loads do not exceed permit limits during periods of enhanced algae growth.
- Marysville should ensure that monthly average effluent BOD<sub>5</sub> concentrations and loads do not exceed permit limits.

# **Bioassay Results**

- Marysville should characterize effluent toxicity by testing as outlined in section 050 of WAC 173-205.
- Bioassays specific to marine organisms should be conducted to evaluate the potential for effluent toxicity at the edge of the dilution zone.

# **Split Samples**

- Marysville should ensure that the composite sample is mixed during aliquot breakdown.
- Marysville should ensure that holding temperatures for effluent samples are held at less than 4° C.

# Introduction

A Class II inspection was conducted at the City of Marysville Municipal Wastewater Treatment Plant (WWTP) on March 3-6, 1996. Several industrial contributors to the treatment plant were also examined. Guy Hoyle-Dodson and Steven Golding, environmental engineers for the Washington State Department of Ecology Toxics Investigations Section, conducted the investigation. Mike Dawda, Ecology Northwest Regional Office permit manager, provided background information and assisted during the inspection. Dale Thayer, Marysville WWTP manager, provided information on facility operation and assistance on site.

The Marysville WWTP serves the city of Marysville and surrounding area, which include residential, commercial, and industrial contributors. An NPDES Permit (No. WA-002249-7) was issued June 20, 1994 with an expiration date of June 20, 1999. Industrial facilities that contribute to the system include such activities as metal finishing, egg processing, feather processing, berry processing, and tanning. Three facilities were identified as major contributors of flow and five-day Biochemical Oxygen Demand (BOD<sub>5</sub>):

- 1. National Food Corporation (egg processing)
- 2. Pacific Coast Feathers Company (duck and goose feather processing)
- 3. Quil Ceda Tanning Company (specialty hide tanning and dyeing)

The Class II inspection was initiated by the Department of Ecology to evaluate permit compliance and provide information about facility loading and performance. Results from industrial contributors will be used to develop effective pretreatment programs. Special attention was paid to treatment effectiveness across the various components of the treatment system. The inspection also focused on flow measurements, concentrations of priority pollutant organics and metals in effluent, and sludge characterization.

Objectives of the inspection included:

- Evaluate NPDES permit compliance by analysis of influent and effluent permit parameters to determine concentrations and loads
- Evaluate wastewater toxicity by comparing priority pollutant organics and metals scan results to Washington State acute and chronic water quality criteria
- Evaluate wastewater toxicity with effluent bioassays
- Evaluate treatment plant performance with the goal of estimating the reaction rate coefficient

- Evaluate WWTP self-monitoring program through sample splits and independent laboratory analysis
- Evaluate sludge toxicity by comparisons to federal and state land application and dangerous waste regulations
- Evaluate oxygen demand parameters, nutrients, complex organics, and metals discharged to the collection system by major industrial contributors

# **Setting**

The Marysville wastewater treatment facility is located in Snohomish County, Washington, south of the city of Marysville on Ebey Slough, a channel of the Snohomish River estuary (Figure 1). The WWTP treatment system uses two complete mix aeration cells, two primary oxidation (waste stabilization) lagoons, and two final polishing lagoons, usually connected in series (Figure 2). A portion of the lagoon system effluent can be treated by a backwash sand filter system, which is then recombined with the unfiltered portion. The final combined effluent is treated by chlorine disinfection.

The WWTP headworks consists of a screwpump, mechanical bar screen, comminutor, grit chamber, and Parshall flume. Influent enters the headworks from two main trunk lines: a west line that is pumped from a wet well on the west end of the facility, and a north line that enters just above the screwpump. All industrial contributors discharge directly to the plant's collection system. Influent flows are measured at the Parshall flume by ultrasonic meter.

Flow from the headworks enters a two cell complete mix aeration system for initial biological treatment. The cells are isolated from the first oxidation pond by hydraulic curtain barriers which extend to its full depth. Floating 25-Hp aerators (eight in Cell #1 and five in Cell #2) provide aeration. The two initial complete mix cells can be operated in either series or in parallel. During the inspection the cells were operated in series. Discharge to the remainder of the first pond is via a narrow breach in the southwest corner of Cell #2's hydraulic curtain.

Flow from the complete mix aeration cells is merged in the first oxidation lagoon with recirculation discharge from the fourth polishing lagoon combined with backwash from the sand filters. A scum baffle just downstream of the recirculation dischargers skims floating debris and grease. The first oxidation pond is not heavily aerated, and appears to act as a facultative lagoon. It is separated from the second oxidation lagoon by another long hydraulic curtain with a small breach at the west end to allow flow. The second oxidation lagoon is also largely quiescent and likely acts as a sedimentation lagoon, although some facultative treatment may occur. Some recirculation is also discharged at the head of the second lagoon.

The final two lagoons act as polishing lagoons and are physically separated from the second oxidation lagoon by a earthen barrier. Two 48-inch culverts to conduct flows from lagoon two to lagoon four. The third and fourth lagoon are partitioned by a hydraulic curtain running the length of a larger lagoon with a breach at the south end. The third lagoon contains six 7.5 Hp aerators which provide localized aeration. The fourth lagoon is unaerated and likely acts as a sedimentation lagoon. At the discharge end of the fourth lagoon there are a series of suction headers for collecting recirculation.

A portion of the effluent from the fourth lagoon can be diverted to a backwash sand filter during high flow for additional treatment of total suspended solids (TSS). During low flows (< 2.8 MGD) this effluent is pumped directly to the chlorine contact chamber for disinfection. During higher flows a portion of the fourth lagoon effluent is treated by the filter and recombined with untreated lagoon effluent before entering the chlorine contact chamber. An in-line meter at the end of the chlorine contact chamber measures effluent flows. Discharge is via a 28-inch diameter polyethylene force main to a 36-foot long diffuser with seven ports fitted with "T" risers. The outfall is located at a depth of 12.5 feet, approximately 181 feet from the north bank of Steamboat Slough, a channel of the Snohomish River estuary which feeds into Possession Sound. The receiving water is designated a marine water body for the purpose of water quality criteria comparisons.

Several industrial dischargers contribute substantial influent loads to the Marysville treatment plant.

# **National Foods Corporation**

National Foods is an egg processor located northeast of Marysville. The facility operates under State Waste Discharge Permit No. 7332, expiration date June 1, 1999. The main sources of wastewater at the plant are:

- washwater generated from washing plastic egg flats using a detergent product called Quorum Yellow
- washwater from egg washing using a product containing sodium hydroxide, trisodium tripolyphosphate, poly oxamer, and sodium chloride
- washwater from egg washing using a product containing iodine and phosphoric acid
- pasteurization process clean-in-place water using sodium hydroxide
- chasing liquids used in the pasteurization process
- truck and floor washings from the truck maintenance shop
- waste eggs from breakage and floor washings, treated by centrifuge to remove the denser egg waste from the wash water (Krigbaum, 1996)

Recovered egg waste is sold to a pet food manufacturer. The plant mixes washwaters containing egg wastes, detergents, and defoamers to sanitary sewage from the facility and discharges this mixture to the collection system. Discharge flow to the collection system is limited to 122,000 gallons per day.

# **Pacific Coast Feathers Company**

Pacific Coast Feathers, also located northeast of Marysville, processes goose and duck feathers. Feathers are cleaned and rinsed in a series of washers. The resulting cleaned feathers and down are air dried and separated by blowers. Pacific Coast Feathers contributes over 300,000 gallons per day to the collection system. The process wash water discharged to the collection system contains animal wastes, oils & grease, polyflock, detergents, and surfactants (Crider, 1996)

# **Quil Ceda Tanning Company**

Quil Ceda, located within Marysville on Quilceda Creek, cures largely specialty animal hides (deer, elk, moose, bear, antelope, goat, caribou, and cow) producing finished leather. The facility operates under State Waste Discharge Permit No. 7270, expiration date October 30, 1999. The process utilizes salt as an initial preservative, hydrated lime and soda ash as a caustic to remove animal wastes, a chemical reactant consisting of ammonium sulfate and Warmteck to remove soda ash and lime from the hides, a chromium and sulfuric acid solution to preserve the hides, organic dyes for coloring, talcum for softening, and steam drying. A separate sulfide treatment system employing magnesium sulfate and alum removes solids from the caustic wastewater and produces a supernatant which is pumped through the main wastewater treatment system.

The main wastewater treatment system consists of a series of sedimentation and aeration tanks. In the first aeration tank phosphoric acid, an enzyme, and a bacterial culture is added to initiate biological treatment. The wastewater proceeds through several additional aeration tanks, with chlorination in the final tank. Daily discharge to the collection system is limited by permit to 16,000 gallons. Sludge from the sulfide treatment system is added to sludge from the main wastewater treatment system and sold as fertilizer. Other solids produced by the tannery are hauled to a landfill (Fifield, 1996).

# **Procedures**

Ecology collected both grab and composite samples at the WWTP. Composite samples were collected March 5-6 from wastewater at the plant at three stations (Figure 2 & Appendix A): influent at the headworks just upstream of the Parshall flume, flow from complete mix Cell #2 into the first oxidation pond, and disinfected effluent just above the final weir. All strainers were submerged approximately 12 inches below the surface of the flow and positioned to prevent entrainment of sediments. The Cell #2 station compositor was transported by boat to its location and mounted on a small floating platform near the breach in the hydraulic curtain. Additional composite samples were collected March 5-6 from the discharge to the collection system of two industrial contributors: Quil Ceda Tanning Company and National Foods Corporation. The Quil Ceda sample was collected from a holding tank just prior to discharge, and the National Foods sample was collected from a manhole just upstream of the collection system.

All composite samples were collected using Ecology ISCO composite samplers with equal volumes of the sample collected every 30 minutes over a 24-hour period. Due to an apparent pump malfunction, the effluent compositor collected sample aliquots that contained less volume than had been originally programmed for. However, the compositors collected the full 48 samples over the 24-hour collection period and inspection of the pump mechanism suggests that each aliquot volume was equal and the total volume collected was representative of the effluent flow for that period. One transfer blank was collected on March 4 by running deionized (DI) water through the effluent compositor prior to sampling.

Grab samples for oil & grease, TSS, and volatile organics were collected at influent and effluent composite stations, both in the morning and afternoon of March 5. Single grab samples for a wide range of general chemistry parameters were taken March 5 from the second oxidation pond's discharge to the third lagoon, from the fourth lagoon's effluent, from the sand filter's discharge to the chlorine contact chamber, and from the sand filter's backwash recirculation flow. A morning and afternoon grab sample for fecal coliform was taken March 6 from the final effluent. A three-part grab-composite for bioassays was collected March 5-6 from the effluent just prior to the chlorine contact chamber to avoid chlorine contamination of the sample. A two-part grab-composite was also collected from Pacific Coast Feathers effluent the afternoons of March 5 and 6. Two separate grabs were collected from the Quil Ceda composite sample location, one on March 5 and the other on March 6. Finally, a grab-composite was collected by petite ponar from three locations in fourth lagoon's sediments on the evening of March 6.

Marysville personnel collected composite samples at the influent headworks and above the final effluent weir. The Marysville influent and effluent samples were taken March 6. The Marysville sample locations were similar to the locations of the Ecology influent and final effluent composite samplers. Marysville composite samples were split for analysis by both

Ecology and Marysville laboratories. Parameters analyzed, samples collected, and the sampling schedule appear in Appendix B

Samples for Ecology analysis were put in appropriate containers and preserved as necessary. Samples were packed in ice for delivery to the Ecology Manchester Laboratory. Holding time restrictions were observed for all samples. Analytical procedures and laboratories performing the analyses are summarized in Appendix C. Sampling quality assurance included priority pollutant cleaning of sampling equipment (Appendix D).

# **Quality Assurance/Quality Control**

A transfer blank was submitted for semi-volatile organics and metals analyses. Sampling quality assurance included ultra cleaning (priority pollutant cleaning) of sampling equipment to remove trace priority pollutant contaminants. Sampling in the field followed all protocols for holding times, preservation, and chain-of-custody set forth in the Manchester Environmental Laboratory Lab Users Manual (Ecology, 1994).

Laboratory QA/QC, including holding times, Laboratory Control Sample (LCS) analysis, matrix spike and duplicate spike sample analyses, surrogate recoveries, and precision data were, with the exceptions noted below, within appropriate ranges. Initial calibration verification standards and continuing calibration standards were within relevant USEPA (CLP) control limits. Procedural blanks were predominantly free from contamination. For bioassays the conduct of testing, responses to positive and negative controls, and water quality data were all appropriate. Qualifiers are included in the data table where appropriate. The following are specific concerns:

# General Chemistry

The extraction process for the oil & grease analysis produced emulsions that were difficult to break, reducing extraction efficiency which could produce low results. All oil & grease samples were qualified with a "J" indicating an estimated result. Soluble BOD for treatment plant influent and aeration cell composite samples, as well as 5-day and inhibited BOD for the National Foods composite sample, were all qualified with a "G", indicating that the result is greater than the value reported. This was due to insufficient dilution of these samples, producing a 5-day dissolved oxygen concentration of less than 1 ppm.

# Volatile and Semivolatile Organics

Low levels of certain target volatile and semi-volatile compounds were detected in laboratory blanks. The EPA "five times rule" was applied to all target compounds that were found in the blank. If the concentrations of the compounds in the samples were

greater than or equal to five times the concentration of the compounds in the associated method blank, they are considered native to the sample. Matrix spike and matrix spike duplicate recoveries for the water sample volatiles were approximately 50% of expected. This has been attributed to inadvertently spiking solutions at half the specified levels. Because relative percent differences (RPDs) are within specifications no qualifiers have been added unless there was no recovery. Any target compounds not within acceptable QC limits for both percent recovery and RPD have been qualified with a "J" to indicate that the result is an estimate. One compound was not recovered and the data was rejected (REJ). Three samples had internal standards outside of accepted limits. Dilutions were analyzed on all samples to provide better quantitation results. The dilution appeared to reduce matrix interference, and the internal standard area counts were acceptable in the reanalysis.

#### Metals

Spike recoveries in the sludge sample for thallium by GFAA and antimony by ICP were low. Recovery of antimony in the LCS sample was also low. These parameters are qualified with "UJ" as undetected at the estimated detection level due to the observed low spike recoveries. Chromium and zinc spike levels were reported "NC, as not calculated, due to the sample level being four times the spike level. Spike recoveries in the water samples were low for arsenic, lead, selenium, and thallium. They are qualified as "UJ" as undetected at the estimated detection level or J as estimated due to the observed low spike recoveries. Water sample lead results are qualified with a "J" as an estimate or a "UJ" as undetected at estimated detection levels due to RPD precision being outside CLP acceptance windows.

#### Chlorinated Pesticides/PCB

Water surrogate recoveries were low for several parameters resulting in the application of the "J" qualifier to indicate that the result is an estimate. This may have been due to matrix effects.

#### **Results and Discussion**

#### Flow Measurements

Marysville determines plant effluent flows for NPDES permit reporting purposes by totalizer flow measurements at the effluent weir. Influent flows are determined, also by totalizer flow measurements, at the headworks Parshall flume. Daily 24-hour (08:00-08:00) totalized influent flows reported by Marysville were 4.11 MGD for March 4-5 and 3.95 MGD for March 5-6, with an average daily flow over the two-day period of 4.03 MGD. Effluent flows for each day of March 3-6 were 3.85 MGD, 3.84 MGD, and 3.83 MGD respectively (average: 3.84 MGD).

The exact cause of the difference in influent and effluent flows is unknown, but may be due to non-steady state flow, evaporation, lagoon liner failure, or inaccurate flow meters. The inaccessibility of influent Parshall flume and effluent weir precluded independent verification of flow measurements. The accuracy of all flow meters should be verified by Marysville. Flow through the sand filters for March 5-6 was estimated to be 1.24 MGD, leaving approximately 2.6 MGD of unfiltered wastewater (68% of total) entering the chlorine contact chamber. Recirculation flow from the fourth lagoon, and reject from the filters, produce a combined flow back to ponds #1 and #2 of almost 13 MGD (estimated from pump capacity). Reject (backwash) flow from the sand filters, as estimated from pump capacity, was approximately 216,000 gallons per day.

The combined daily discharge from National Foods processes to the collection system was 41,040 gallons for the 24-hour period, 14:00-14:00, on March 5-6. Quil Ceda discharged 10,300 gallons to the collection system for a 24-hour period on March 5-6. Pacific Coast Feathers discharged a total of 52,783 gallons for a 24-hour period on March 5-6.

# General Chemistry Results and Treatment Plant Effectiveness

#### Treatment Plant Influent

Ecology general chemistry results are presented in Table 1. Influent concentrations of total solids (TS - 528 mg/L), total suspended solids (TSS - 191 mg/L), and ammonia nitrogen (NH<sub>3</sub>-N - 18 mg/L) were all slightly less than the typical medium concentration for untreated domestic wastewater (Metcalf & Eddy, 1991). Five-day biochemical oxygen demand (BOD<sub>5</sub> - 262 mg/L) was 19% greater than the typical medium concentration. The average influent oil & grease concentration (O&G - 20 mg/L) was 60% less than the typical weak concentration. The total organic carbon (TOC - 92.4 mg/L) was slightly more than the typical weak concentration and the BOD<sub>5</sub>/TOC ratio (2.83) was about two

times greater than typical values. Since the BOD<sub>5</sub> load falls into a typical range, the data suggest a scarcity of the biologically inactive organic carbon load relative to typical treatment plant influents (APHA, 1992). The weakness of the total non-volatile suspended solids (TNVSS - 19 mg/L) concentration in the influent likely represents the absence of typical inorganic constituents and would not account for the paucity of biologically inactive organic carbon loads. The scarcity of compounds resistant to breakdown by conventional biological treatment should result in improved effluent quality relative to other typical treatment plants. A discrepancy between the field and laboratory conductivity results may be due to instrument failure.

#### Aeration Cell Effluent

Aeration in the cells appears to be suitable for oxygenation requirements, but inadequate for complete mixing. A calculated estimate of the aerator power needed to achieve the required oxygen saturation across each cell was 43 6 horsepower (Metcalf & Eddy, 1992), well within the available horsepower observed being used during the inspection. This power calculation uses dissolved BOD<sub>5</sub>, but the reported influent and effluent soluble BOD<sub>5</sub> results (both 17 mg/L) were qualified by the laboratory as representing the lowest possible values with no constraint on an upper limit. The influent result in particular is unusually low for typical domestic wastewater and likely underreports the actual value by a considerable amount.

For the purpose of the oxygenation requirement and power calculations it was assumed that influent soluble BOD<sub>5</sub> was approximately 50% of the total BOD<sub>5</sub> result. This assumption was based on survey results of soluble to total BOD<sub>5</sub> ratios found for a number of typical domestic influents (Viessman & Hammer, 1985; EPA, Oct., 1983). Calculation of theoretical soluble BOD<sub>5</sub> concentration expected in the aeration cell effluent was approximately 11 mg/L, very close to the reported minimum 17 mg/L actually found in the aeration cells effluent. As a result this 17 mg/L minimum value was believed to be representative and was retained for use as the effluent soluble BOD<sub>5</sub> value in all pertinent calculations. As calculated, the estimate of power requirements is believed to be a good approximation.

Reductions in total BOD<sub>5</sub> across the aeration cells approached 52% (Table 2). The reaction rate coefficient  $(k_1)$  for each cell due to respiration alone (no settling included), as calculated using total BOD<sub>5</sub> values and the 1st order kinetic equation (assuming  $k_1$  is the same for each cell in the series), was approximately 0.85 d<sup>-1</sup> (to the base e at 20° C). This value falls into the range of typical  $k_1$  values for similar systems (range: 0.25 d<sup>-1</sup> to 1.0 d<sup>-1</sup> to the base e at 20° C - Metcalf & Eddy, 1992).

The uncertainty in dissolved BOD<sub>5</sub> concentrations and the absence of a clarifier immediately following the aeration cells made quantification of the cells' biological reaction efficiency with settling difficult to determine using conventional algorithms. Assuming that BOD<sub>5</sub> concentration after settling will be largely dissolved BOD<sub>5</sub>, a rough

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estimate of  $k_1$  with settling was derived by equating the 1st order reaction rate equation to the monod equation concerned with soluble substrate removal kinetics and using previously indicated total to soluble BOD<sub>5</sub> ratios. The  $k_1$  for the complete mix aeration cells with substrate settling factored in is approximately 1.3 d<sup>-1</sup> (base e at 20° C). The value is more than twice as great as the minimum  $k_1$  of 0.6 d<sup>-1</sup> (base e and at 20° C) as stipulated for complete mix aerated lagoon systems with settling to ensure full treatment of domestic sewage (Labib, 1996). This would further indicate that biological activity in the cells is of a high order and is sufficient to aerobically treat the Marysville influent BOD<sub>5</sub> load.

During the inspection large quiescent zones were observed in the complete mix cells and it appeared likely that the cells were inadequately mixed. To conform to draft Ecology design criteria for maintaining suspended solids in aerated lagoons, power requirements greater than 50 hp/Mgal are needed (Labib. 1996). At the low end power requirements were calculated to be 244 hp for each 4.89 Mgal complete mix cell. Since the power required for oxygen saturation across each cell was 43.6 horsepower, this indicates that horsepower required for mixing would govern the design. Total horsepower in Cell #1 and Cell #2 is 200 hp (8 - 25 hp aerators) and 125 hp (5 - 25 hp aerators), respectively. For a complete mixed regime, cell #1 is about 82% and cell #2 is about 51% of these minimum power requirements, suggesting that the cells were not adequately mixed. Additional calculations also suggest that considerable settling was taking place in the cells. TSS concentration across the aeration cells decreased from 191 mg/L to 80 mg/L. This reduction (58%) is at odds with an expected estimated increase in TSS of about 39% across these systems due to microorganism growth.

The anticipated accumulation of sludge within the complete mix cells may have a long-term detrimental effect on treatment as volumes decrease and flow is impeded. Marysville should investigate the build-up of sludge in the complete mix aeration cells. Marysville should increase mixing power and coverage in the cells.

# Oxidation Lagoon #2 Effluent

Reductions in total BOD<sub>5</sub> across oxidation lagoons #1 and #2 exceeded 67% (Table 2). An analysis was performed using the 1st order removal rate equation for aerobicanaerobic (facultative) ponds (Metcalf & Eddy, 1992), assuming a range of dispersion coefficients (1-4) and a reaction rate  $k_1$  of 0.12  $d^{-1}$  (recommended minimum  $k_1$  to the base e adjusted to 8.5° C - Labib, 1996). The analysis of the two-lagoon system (with recirculation equal three times the plant flow rate) indicates that the maximum predicted BOD<sub>5</sub> of 26.4 mg/L was 36% less than the measured effluent BOD<sub>5</sub> result (41 mg/L). Maximum calculated  $k_1$  for the system was 0.06  $d^{-1}$  (base e at 8.5° C), less than the recommended minimum  $k_1$  by a factor of two.

It should be noted that Marysville recirculation rate exceeds 3.0 Q (plant flow) and this is greater than the rates of 0.5 to 2.0 Q typically used (Metcalf & Eddy, 1992). Also of note

is the predicted effluent BOD<sub>5</sub> result when analyzed without recirculation from the fourth lagoon (43.1 mg/L - at the highest diffusion coefficient value). The predicted effluent result with recirculation was only 39% less than the predicted result without recirculation. These calculations assumed the same reaction rates, dispersion factor coefficients, and detention times; although the unrecirculated analysis may have lower coefficients (due to less energetic kinetics). The comparison raises questions about the efficacy of recirculation in reducing BOD<sub>5</sub> loads. Although recirculation may provide the alternative benefit of increased treatment of ammonia nitrogen, Marysville should evaluate treatment efficiency without recirculation to determine if the recirculation rate could be reduced or the practice discontinued entirely. It is possible that other solutions for increasing treatment effectiveness for BOD<sub>5</sub> (i.e. reducing algae growth) may be more cost effective.

TSS concentrations across the system decreased 33%, with a final concentration (54 mg/L) typical for these systems (WEF, 1992 and Metcalf & Eddy, 1992). The overflow rate was 11 gal/ $\text{ft}^2$ ·day and the solids loading per unit area was 2.7 X  $10^{\text{--4}}$  lb/ $\text{ft}^2$ ·h. Detention time (4.1 days with recirculation) was greater than recommended minimums for settling after aerated lagoon treatment systems. Assuming a typical range for the volatile solids anaerobic reaction rate coefficient of 0.52 y<sup>-1</sup> to 0.92 y<sup>-1</sup>, the sludge accumulation rate can be expected to range between  $1.87 \times 10^{\text{--5}}$  lb/year to  $2.82 \times 10^{\text{--5}}$  lb/year. With a specific density of about 1.01 the maximum accumulation rate is approximately 0.03 inches/year equally distributed.

#### Stabilization Lagoon #4 Effluent

Total BOD<sub>5</sub> concentration for lagoon #4 effluent of 29 mg/L (Table 1) appears to be low and is suspect for several reasons:

- Final effluent total BOD<sub>5</sub> (53 mg/L) was substantially higher despite additional treatment of a portion of lagoon #4 effluent by the sand filter.
- Final effluent total BOD<sub>5</sub> result appears to be the more reliable than the fourth lagoon total BOD<sub>5</sub> value, since it is closely matched by a concurrent CBOD<sub>5</sub> result (48 mg/L), which is almost 40% greater than the lagoon #4 total BOD<sub>5</sub> result.
- Lagoon #4 effluent TOC concentration was also higher than the lagoon #4 total BOD<sub>5</sub> value, whereas the opposite is usually the case due to the BOD<sub>5</sub> test's oxidation of other organically bound elements, such as nitrogen and hydrogen (APHA, 1992).
- The filter effluent total BOD<sub>5</sub> result (27 mg/L) has almost the same concentration as the lagoon #4 total BOD<sub>5</sub> result despite considerable removal of BOD<sub>5</sub> load as evidenced by the backwash BOD<sub>5</sub> concentration.

The reason for the anomalous total BOD<sub>5</sub> result is unknown. Lagoon #4 effluent total BOD<sub>5</sub> concentration was calculated from a mass balance of filter effluent load and final effluent load and found to be approximately 65.4 mg/L. For the purposes of the inspection the calculated value of lagoon #4 effluent total BOD<sub>5</sub> seems more reliable.

The increase of total BOD<sub>5</sub> in lagoon #4 effluent above that in lagoon #2 effluent may be attributed to algae growth in the polishing lagoons.

Using the calculated lagoon #4 effluent total BOD<sub>5</sub> concentration, total BOD<sub>5</sub> across polishing lagoons #3 and #4 increased about 60%. The predicted reduction in BOD<sub>5</sub> is between 65% to 80%. This is based on the recommended reaction rate coefficient of 0.10 d<sup>-1</sup> (adjusted to 5.2°C - Labib, 1996), a range of dispersion factors (0.05-4.0), and a detention time which excludes recirculation. The difference between predicted and actual is most likely due to algae growth in the lagoons, although variations in plant loading cannot be discounted. TSS also increased 17%, which is also consistent with the growth of algae. This increase occurred during seasonably mild temperatures and during the hotter summer months algae growth would likely be much greater, creating even greater BOD<sub>5</sub> concentrations.

Lagoon overflow rate (10.5 gal/ft²·d) and sludge loading (2.3 x 10<sup>-4</sup> lb/ ft²·h) were well within typical peak values. The sludge accumulation rate across the lagoons #3 and #4 could not be calculated due to the increase of solids across the system. It can be assumed that some settling occurs. Since the retention time with recirculation (4.2 days) in lagoons #3 and #4 is similar to that in the previous two lagoons and TSS loads to the lagoons are less, it is reasonable to expect that the sludge accumulation rate is no greater than that in lagoons #1 and #2. The 1994 hydrographic survey of the Marysville facility indicates that sludge accumulation is heaviest in portions of lagoon #1, with more moderate accumulations in portions of lagoons #3 and #4 (Livingstone Associates, 1994). The depth of sludge accumulation in lagoons #3 and #4 may also be attenuated by facultative assimilation of organic wastes into algae.

#### Sand Filter Effluent

Filtration across the sand filter achieved a 65% reduction in TSS load and an overall 18% reduction in the final effluent TSS load (Table 2). Using the calculated total BOD<sub>5</sub> for the lagoon #4 effluent, total BOD<sub>5</sub> was reduced 59% across the sand filter, for a 36% reduction of the final effluent BOD<sub>5</sub> load. Dissolved BOD<sub>5</sub> was reduced 20% and 5.4% in each case, respectively. There was also reduction in Kjeldahl nitrogen and total phosphorus. A reduction in ammonia nitrogen (13%) and a concurrent increase in nitrate and nitrite nitrogen concentration across the filter indicates that nitrification was taking place. The latter concentration increased by a factor of 20.

#### Treatment Plant Effluent

Reductions across the entire system were calculated and the results presented in Table 2. Ecology results showed a total BOD<sub>5</sub> reduction from 262 mg/L in the influent to 53 mg/L in the effluent (approximately 80% removal). Carbonaceous BOD<sub>5</sub> showed a 75% reduction. Total suspended solids (TSS) decreased from 191 mg/L to 47 mg/L with a removal efficiency of approximately 76% across the system. Removal efficiency across

the plant for TOC was 59%. Kjeldahl nitrogen, ammonia nitrogen, and total phosphorous were reduced 29%, 19%, and 40% respectively. Nitrate and nitrite nitrogen increased 117%, from 0.39 mg/L to 0.868 mg/L, an increase that appeared to take place largely in the sand filter. Analysis of Marysville samples displayed similar reductions for TSS, but showed greater removal efficiencies for carbonaceous BOD<sub>5</sub> and total BOD<sub>5</sub>. The data suggest moderately effective treatment of TSS and BOD<sub>5</sub> and less effective nitrification. Chlorine residual concentrations in all samples were less than detection limits.

An Ecology-approved city of Marysville mixing zone study (Jones and Stokes, 1996) suggests mixing zone dilution factors of 8.8 and 17 for acute and chronic zones respectively. A mass balance calculation incorporating Washington State Water Quality Standards mixing zone specifications was calculated to project maximum end-of-pipe concentrations which would not produce violations of total ammonia criteria at the acute and chronic dilution zone boundaries (Ecology, 1994). The calculation uses an adjusted total ammonia nitrogen criteria based upon the receiving water pH, salinity, and temperature observed for March during a 1993-1994 receiving water study (Jones and Stokes, 1994). The upstream receiving water ammonia concentration was taken from a 1995 TMDL study (Cusimano, 1994). The maximum allowable whole effluent ammonia nitrogen concentrations were 181 mg/L and 51.9 mg/L for the acute and chronic criteria respectively. The effluent ammonia nitrogen concentration (15 mg/L) determined during the inspection was within the allowable acute and chronic concentrations.

# Industrial Contributor Discharge Results and State Permit Comparisons

# National Foods Corporation

Table 3 compares inspection results to state discharge permit limits. The pH of the Ecology composite sample result for National Foods discharge was 11.92. This exceeds the specific prohibition cited in the facility's state waste discharge permit, limiting all pH results to between 5.0 and 11.0. National Foods should lower discharge pH to meet the permit limit. Although the inspection result did not exceed specific dangerous waste corrosivity limits (12.5) the composite sample was sufficiently close to warrant attention.

The Ecology total BOD<sub>5</sub> composite result was equal to or greater than 820 mg/L (281 lbs/day). The actual BOD<sub>5</sub> concentration is tentative, since the result was qualified with a "G" indicating that it was a minimum value and that the actual value was greater than or equal to the reported value. The lowest possible value was within the interim effluent limit (1500 mg/L & 700 lbs/day - authorized through June 30, 1996). The minimum value exceeds the final effluent limit for BOD<sub>5</sub> (300 mg/L - beginning July 1, 1996) and National Foods should ensure that discharges will meet the new limits.

The Ecology TSS composite result (83 mg/L) was well within interim and final effluent limits (350 mg/L). The discharge's contribution to the Marysville treatment plant influent represents about:

- $\geq 3\%$  of the BOD<sub>5</sub> load,
- $\geq 2\%$  of the CBOD<sub>5</sub> load,
- 7% of the TOC load,
- 1% of the phosphorus load.

Other parameter contributions to the treatment plant influent were less than 1%.

#### Pacific Coast Feathers Company

The Ecology BOD<sub>5</sub> grab-composite sample result (318 mg/L) for the Pacific Coast Feathers discharge exceeded the state waste discharge permit daily maximum limit of 300 mg/L. Pacific Coast Feathers should reduce daily BOD<sub>5</sub> to below the permit limit. The Ecology TSS result (281 mg/L) was about 80% of the permit limit. Care should be taken to ensure that variability in daily TSS concentrations does not exceed permit limits. TOC, oil & grease, and ammonia nitrogen results were 353 mg/L, 55 mg/L, and 15 mg/L respectively. The discharge's contribution to the Marysville treatment plant influent represents about:

- 1.5% of the total BOD<sub>5</sub> load,
- 10% of its TOC load.
- 2% of the TSS load,
- 4% of the oil & grease load,
- slightly more than 1% of its ammonia nitrogen load.

# Quil Ceda Tanning Company

The Ecology BOD<sub>5</sub> composite sample result (373 mg/L) for Quil Ceda discharge exceeded the state waste permit daily maximum of 300 mg/L by 24%. Quil Ceda should reduce BOD<sub>5</sub> concentrations to within permit limits. TSS (60 mg/L), oil & grease results (estimated at 8 and 10 mg/L), and sulfide results (1.2 and 1.5 mg/L) were well within state permit limits. Conductivity and hardness were 13,600 μmos/cm and 772 mg/L respectively. The discharge's contribution to the Marysville treatment plant influent represents about:

- less than 1% of the total BOD<sub>5</sub> load,
- less than 0.1% of the TSS load
- 1.4% of the ammonia nitrogen load,
- 2.0% of the Kjeldahl nitrogen load,
- less than 0.1% of the oil & grease load,

# **NPDES Permit Comparisons**

Table 4 compares inspection results to NPDES permit limits. The permit allows different TSS limits depending on the proportion of flow above or below 2.8 MGD. A calculation is used to determine the combined flow proportional concentrations of fourth lagoon effluent and filter effluent to compare to limits for flows under 2.8 MGD. The permit limits for flow above 2.8 MGD are compared directly to final effluent concentrations. The fourth lagoon and filter effluent TSS concentration (60.1 mg/L), as modified to reflect portions of the effluent below 2.8 MGD, was within NPDES permit monthly and weekly average limits. The TSS load for this portion (1403 lb/day) was under the maximum monthly and weekly average permit load. The TSS concentration (22 mg/L) and load (194 lb/day) for the filtered portion exceeding 2.8 MGD were also within permit monthly and weekly average limits. Percent reduction from the influent concentration for the portion that exceeded 2.8 MGD (89%) was greater than the 85% minimum monthly average reduction required by the permit. The TSS concentration was 80% of the weekly limit and Marysville should ensure that the limit is not exceeded during months when algae growth is more prolific.

The Ecology composite 24-hour effluent CBOD<sub>5</sub> concentration (48 mg/L) exceeded the permit monthly average limit by 92% and the weekly average limit by 20%. The effluent 24-hour composite CBOD<sub>5</sub> load (1533 lb/day) exceeded NPDES permit monthly average effluent load limits by 21%, but was within the weekly average load limit. The percent reduction from the influent concentration (75%) was less than the minimum monthly average reduction (85%) required by the permit. Marysville 24-hour effluent CBOD<sub>5</sub> results (16 mg/L) were within permit limits, but it is believed that the result underreports the actual concentration due to the high sample holding temperature (9.4° C). Marysville should ensure that monthly effluent concentrations and loads do not exceed permit limits. BOD<sub>5</sub> samples should also be preserved at 4° C before analysis.

Effluent fecal coliform results were well below permit limits and pH results were within the stipulated range. The reported totalized average influent flow of 4.03 MGD was well below the NPDES permit design limit of 6.1 MGD. Influent BOD<sub>5</sub> concentrations and load were well below both permit overloading limits.

# **Detected Priority Pollutant Organics and Metals**

Table 5 summarizes concentrations of organic parameters detected with priority pollutant scans. Table 6 summarizes detected priority pollutant metals. Appendix E contains results of all targeted organic compounds and metals results. Tentatively identified compounds are presented in appendix F. A glossary is included in appendix G.

#### Marysville Treatment Plant

Three VOA compounds and six BNA compounds were detected in the treatment plant 24-hour composite effluent sample (Table 5), but concentrations did not exceed either freshwater or marine acute and chronic water quality criteria. Influent results displayed one appreciable VOA concentration (methylene chloride - 251  $\mu$ g/L-estimated) and two appreciable BNA concentrations (benzoic acid - 230  $\mu$ g/L-estimated and 3b-coprostanol - 300  $\mu$ g/L-estimated).

Five priority pollutant metals were detected in the plant effluent (Table 6). Only one, copper (10  $\mu$ g/L), exceeded the marine acute water quality criteria (2.5  $\mu$ g/L) in the whole effluent. Dilution in the receiving water (dilution factor: 8.8) should reduce this concentration to less than 46% of the acute criteria. Influent concentrations include chromium (9.8  $\mu$ g/L), copper (46  $\mu$ g/L), and lead (6.7  $\mu$ g/L-estimated).

#### Quil Ceda Tanning Company

A single VOA compound, acetone, was detected at elevated concentrations in the two Quil Ceda grab samples, one at 52,700  $\mu g/L$  and the other at 58,800  $\mu g/L$ . Total discharge load was approximately 5.1 lbs/day. This load is equivalent to a concentration in the treatment plant influent of about 150  $\mu g/L$ , but it apparently volatilized in the collection system before reaching the Marysville treatment plant. Five detected BNAs were discharged to the collection system from Quil Ceda. Only Benzoic acid was discharged at an appreciable concentration (122  $\mu g/L$ ). Four metals were detected in the Quil Ceda discharge. The highest concentration found was chromium (515  $\mu g/L$ ), but the discharge load (0.044 lbs/day) was calculated to contribute less than 14% to the treatment plant influent chromium load (0.329 lbs/day).

# **Effluent Bioassays**

Ecology bioassay results detected no acute effluent toxicity, but considerable chronic effluent toxicity (Table 7). The *Daphnia magna* acute 48-hour survival test found 100% survival at all concentrations in the dilution series, except at 100% effluent which produced a 5% mortality. Statistical analysis determined that the Lowest Observable Effective Concentration (LOEC) and the No Observable Effective Concentration (NOEC) were both greater than 100%.

The fathead minnow (*Pimephales promelas*) chronic 7-day survival and growth test found generally declining survival and growth with increasing concentration (90% of fathead minnows died after 7-days in 100% effluent). The survival analysis produced an LC50 of 57.75%, LOEC of 25%, and NOEC of 12.5%. The growth analysis produced a LOEC of 12.5%, NOEC of 6.25%, and 25/50% growth inhibition concentration (Icp) of 10.5%.

Since the NOEC is 6.25%, this represents a statistically significant difference in response at a concentration lower than the acute critical effluent concentration (an acute dilution factor of 8.8 produces a critical concentration at 11.4% of 100% effluent)

The chronic test exceeds the performance standard cited in the Washington State Whole Effluent Toxicity Testing and Limits (WAC 173-205). Since a reasonable potential exists for chronic conditions in the receiving water, it is suggested that the effluent be further characterized by toxicity testing as outlined in section-050 of WAC 173-205. Since Marysville discharges to a marine water, it is also recommended that bioassays specific to marine organisms be conducted to evaluate the potential for effluent toxicity at the edge of the dilution zone.

The cause of toxicity in the effluent might be ammonia or copper concentrations, since both were found to exceed chronic water quality criteria in the whole effluent. The facility should investigate treatment methods to decrease the discharge of these contaminates to the receiving water.

# **Split Samples**

#### Sample Comparisons

With the exception of Ecology TSS results, analysis of the Ecology and Marysville influent composite samples collected October 5-6 generally compared well (Table 8). Relative percent differences (RPD) between pairs of BOD<sub>5</sub> and pH samples were less than variation in precision cited in the EPA comparison of interlaboratory analysis of selected parameters (EPA, March, 1983). The RPD between influent TSS values is close to four times the interlaboratory variation in precision. This suggests there is a difference between Ecology and Marysville composite sampling techniques with a predominate effect on TSS, and this may be due to inadequate mixing when dividing the sample for analysis. Ecology and Marysville TSS results for their respective effluents grab samples from pond #4 and the filter were more closely matched, perhaps reflecting grab samples being less susceptible to mixing errors.

Ecology BOD<sub>5</sub> and CBOD<sub>5</sub> results for Ecology and Marysville effluent samples were divergent, with a RPD of 65% and 100% respectively. As previously mentioned this may be the result of elevated holding temperature for the Marysville sample, which would likely produce the lower Marysville BOD<sub>5</sub> concentrations. Marysville should ensure that holding temperatures for effluent samples are held at a temperature less than 4° C.

#### Laboratory Comparisons

Ecology and Marysville laboratory results for influent samples collected by Ecology were well matched, with RPDs between samples of 6.7% for TSS, 4.3% for BOD<sub>5</sub>, and 1.1% for CBOD<sub>5</sub>. The two labs BOD<sub>5</sub> and CBOD<sub>5</sub> results for the Marysville sample were also close (RPD: 6.6% and 7.1% respectively) This would suggest that the Marysville laboratory performance was good.

# Sludge

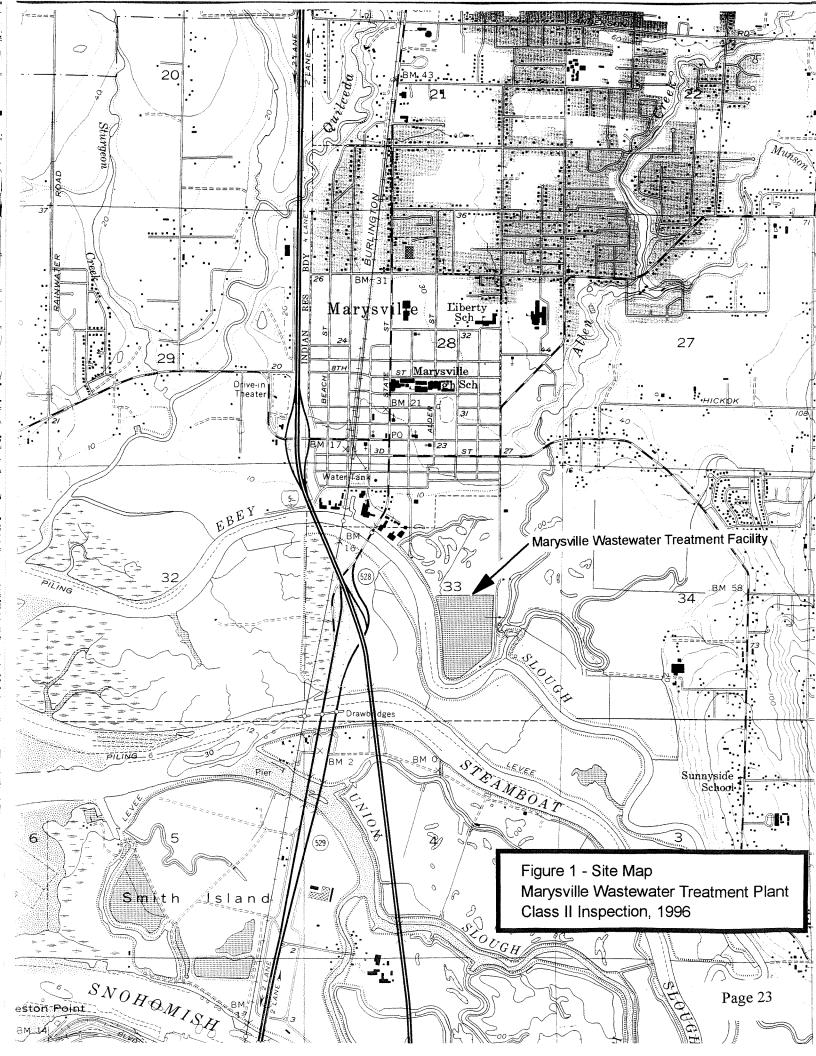
#### General Chemistry

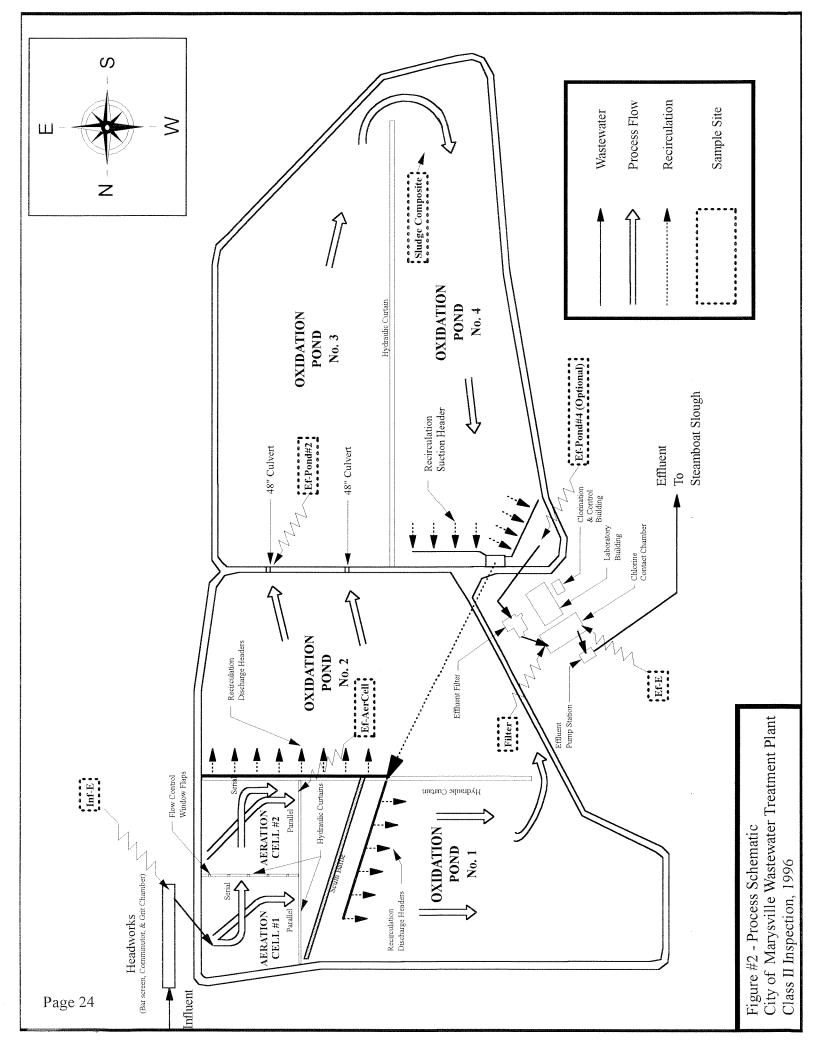
Total Kjeldahl nitrogen in the sludge was 17,300 mg/Kg dry weight or, given a percent solids of 11.4%, about 1972 mg/L-wet weight (Table 1). Total accumulated sludge, as reported by the 1994 Marysville biosolids quality evaluation (Livingstone Associates, 1994), is approximately one foot evenly distributed over the four ponds for a total sludge volume of 9.05 X 10<sup>7</sup> liters. This represent about 3.94 x 10<sup>5</sup> lbs of nitrogen. Nutrient uptake rates of nitrogen for various forage crops range from 50 lbs/acre-year to 480 lbs/acre-year. For sustainable land application this load would require a minimum of at least 820 acres for application over one year.

The sludge dry weight fecal coliform density was 149 colonies (most probable number) per gram (1700 #/100 grams - wet wt.). This is less than the maximum limit for fecal coliform density of 1000 #/g dry wt. required for Class A sewage sludge land application (EPA, 1993).

# **Detected Priority Pollutants**

Five VOA compounds and eight BNA compounds were detected in the composite sludge sample. One BNA compound, 3B-coprostanol, was detected at 97,500 μg/Kg-dry wt. Eleven metals were detected in the sludge. Copper, lead, and chromium concentrations (234 mg/Kg-dry wt., 139 mg/Kg-dry wt., and 254 mg/Kg-dry wt. respectively) reflect the removal over time of influent concentrations. The concentrations of priority pollutants in the sludge did not exceed either EPA standards for land application of sewage sludge or screening concentrations for the dangerous waste designation criteria (Table 9). Chromium and lead did approach 30% and 16% of the dangerous waste screening concentration (20 times maximum leachate extract toxicity limit).





Parameter Location: Inf-E-1 Inf-E-2 Inf-E Inf	Location:	Inf-E-1	Inf-E-2	, Inf-E	Inf-M E	Ef-AerCell	Ef-Pond#2	Ef-Pond#4	Filter	Ef-E-1	Ef-E-2	Ef-EGrab1	EF-EGrab2
	Trino.	4020	grob	d title	9	conco	horr	horn	dono	doro	4020	40,40	dorrob
	Type:	grao	grao	comp	comp	comp	grab	grao	grao	grao	grau	grao	grao
	Date:	03/5	03/5	03/5-6	03/5-6	03/5-6	03/5	03/5	03/5	03/5	03/5	03/6	03/6
	Time:	0660	1650	08:00-08:0	08:00-08:00 08:00-08:00 08:00-08:00	00:80-00:80	1715	1740	1040	1200	1810	1100	1810
, ,	Lab Log #:	108230	108231	108232	108233	108234	108235	108236	108237	108238	108239	108252	108253
GENERAL CHEMISTRY	IISTRY												
Conductivity (unthos/cm)	s/cm)	466	915	483		487	477	467	468	469	467	471	
Alkalinity (mg/L CaCO3)	CO3)			153		149	146	141	103			125	
Hardness (mg/L CaCO3)	(03)			55.4			) •	1				ì	
Sulfide (mg/L)	×	1 1	111	E.							111		
corms		•	•							•			
			200000000000000000000000000000000000000	3			3	1	•				
15 (mg/L)				×70		S.S.S.	38G	505	7/7				
TNVS (mg/L)				204		315	212	175	195				
TSS (mg/L)		125	131	161		08	54	63	22	<del>*</del>	33		
TNVSS (mg/L)				19		11	ĸ	S	9				
% Solids													
% Volatile Solids													
OXVCEN DEMAND PARAMETERS	PARAMETERS	,,											
DOMEST TO THE	WALAMENET			***	× * *	\. e +	· · · · · · · · · · · · · · · · · · ·	C	r				
ECUDO (MIG/L.)				707	۲+7	170	<del>1</del>	67	<i>*</i> 7				
CBOD5 (inhibited -mg/L)	mg/L)		750000000000000000000000000000000000000	185	189				500000000000000000000000000000000000000				000000000000000000000000000000000000000
BOD5 (Soluable -mg/L)	g(L)			Ø		17 G	'n	'n	D T				
TOC (water mg/L)				92.4		57.1	53	50.5	30.6				
TOC (soil)													
NUTRIENTS													
Total Kjeldahl Nitrogen (TKN) (ing L)	gen (TKN) (mg/	E)		27		23.4	26.2	24.7	15.1				
NH3-N (mg/L)				18		16	16	16	14				
NO2+NO3-N (mg/L)				0.387		0.133	11 100	0.086					
Total-P (mo/I)				4 96		4 07	4 08	3.91	1 57				
MISCELLANEOUS	S			) :			2		): -				
Oil and Grease (mad )		1 LC	1.3.1								1 6		
F-Coliforn MF (#/100ml)	mk OOmT )									¥	ì	r	11 °C
Escal Collidan (#/100mm)	00111L) impant #71:00om	7										J	
FIFT D ORSERVATIONS	TIONS	7											
Tamparatura (9C)		11.0	72.7				v	0.0	¢		76	<b>1</b> 0	۲,
Temp Color (°C)+-		3 1	, i	0 (	10	<i>L</i> C	ì	X	į		2	<b>,</b>	ì
Tellip-cooled ( C)		04 1	T	(.7 1 A A	01	t.4 t	001	crr	20.7		ř	ř	c-t
	()	204	101	†	67.7	7,47	7.00	7 .	0,70 717		7.21 1-1	7.04 - C.C	7.12
Colductivity (unimos/cin.)	s/cm.)	+K7	0/0	167	341	507	CIC	517	510		317	521 6.61	491 20.04
Jul	influent sample		i i	Ff-Pond#4 Po	Pond #4 effluent sample	mole	+	Refrigerated sample	elun			10.00	DV:V4
J.J.	offluent sample		1		I ond #4 chidon sampro	samule	<u>'</u> ' ' '	The result was	upic reater than the	Jaline renorted	INCLUSES and a small to the same of the same of the result is a minimum value	ninimim value	
T.	Frology sample		Ţ	-	AM effluent fecal coliforn sample	sampro oliforn sample	- 0	The analyte wa	s positively iden	iffed. The associated	ciated numerica	The analyte was nocified identified. The associated numerical result is an estimate	mate
	Markeville sample	<u>o</u>	j [1		The convent focal conform sample	oliforn sample	. I	The analyte wa	The analyte was positively recipility. The associated fidulity.	or above the re	clared manner real	n result is an esti	marc.
BE Apropell	Marytion cell effluent sample	it.	1		Composite cample	omoun sampic	O .	ine analyte wa	אווות תכוכרוכת מו	of above the re	ported resurt.		
	ACIALION CON CIL	iucin sampic			miposite sample								
7#puo.f-13	Fond #2 effluent sample	sample		grap	Grab sample								

Location: E.P.F.   E.P.B.    E.P.M.   TrackElls   Studge   Not-Food   PGT-enth   E.P.GC-1   E.P.GC-2     Date: Comp   grade-comp   grade   g												
Type: comp   Comp   Stab   S		i .	Ef-Bio	Ef-M	Trnsf-Blk	Sludge	Nat-Food	PCFeath	Ef-QC-1	Ef-QC-2	Ef-QC	BackWash
Partic   1975-6   1			grab-comp	comp	grab	grab	comp	comp-grab	grab	grab	comp	grab
Time: 08:00-08:00   1910   108243   108244   108245   108247   118292   108244   108245   108247   118292   108244   108245   108247   118292   108247   118292   108247   118292   108247   118292   108247   118292   12820   128200   12			03/5.	03/5-6	03/4	03/5	03/5-6	03/5&6	03/5	03/5	03/5-6	03/5
Lab Log #: 108240   108242   108242   108244   108245   108246   108247   1E405     Lab Log #: 108240   108241   108242   108245   108246   11800     Lab Log #: 108241   124   125   125     Lab Log #: 108241   124   124   125   125     Lab Log #: 108242   126   12800   12800     Lab Log #: 108242   126   12800   12800     Lab Log #: 108242   126   126   126   126     Lab Log #: 108242   126				08:00-08:00	) 1310	1810	08:00-08:00		1620	1345	08:00-08:00 1100	0 1100
Calc(O3)   S2 7   A 57   B 58   B 5	Lab I		108241	108242	108243	108244	108245	108246	108247	1E+05	108249	108251
1.00   1.00	GENERAL CHEMISTRY											
1.15	Conductivity (umhos/cm)		467				787	456	13600	13800	13600	478
15   15   15   15   15   15   15   15	Alkalinity (mg/L CaCO3)						308	65.5				112
11.2   1.5	Hardness (mg/L CaCO3)	52.7									772	
184	Sulfide (mg/L)								1.2	1.5		,
184   35   51   83   281   72   96	SOLDS											
184   35   51   11.4	TS (mg/L)	303										719
11.4   11.4	TNVS (mg/L)	184										253
11.4   1.4   1.1.4	TSS (mg/L)	£#	35	51			83	281	72	96	09	391
114   114   114   115   114   115	TNVSS (mg/L)	4										375
Sample   S	% Solids					<del>+</del> 11						
Control   Cont	% Volatile Solids					3.2						
Second   S	OXYGEN DEMAND PARAMETERS	. 1										
Feb   Part   P	BOD5 (mg/L)	53		27			>820 G	318			373	308
10   19.9   19.7   19.9   1972 #   1.11   15   19.9   1972 #   1.11   15   19.9   1972 #   1.11   15   19.9   1972 #   1.11   15   19.9   19.0   19	CBOD5 (inhibited -mg/L)	48		16			>413 G					
1,   1,   1,   1,	BOD5 (Soluable -mg/L.)											च
1912   1918	TOC (water mg/L)	39.3					899	353			154	179
199   1972 #   1.11   15   15   15   15   15   15	TOC (soil)											
1972 #   1	NUTRIENTS	899000000000000000000000000000000000000	-0000000000000000000000000000000000000	ANNO SERVICE SERVICES	000000000000000000000000000000000000000	200000000000000000000000000000000000000	000000000000000000000000000000000000000	300000000000000000000000000000000000000	200000000000000000000000000000000000000			
15   1.11   15   1.11   15   1.11   15   1.11   15   1.11   15   1.11   15   1.11   15   1.11   15   1.11   15   1.11   15   1.11   1	Total Kieldahl Nitrogen (TKN) (ms					1972 #					145	44.5
December	NH3-N (m9/L)						<u>-</u>	15			137	7
1005    1006	NO2+NO3-N (mg/L)	0.868					2.19	231			0.082	1 51
##   ##   ##   ##   ##   ##   ##   #	Total-P (mg/L)	3.05					4 97	4.6			0.827	5.62
#	MISCELLANEOUS							) :				)
#/100mL)   sediment #/160gm)   varions	Oil and Grease (mg/L.)							55.1	18	101		
1700     1700       1700       1700       1700       1700       1700       1700       1700       1700	F-Coliform MF (#/100mL)											
102   102   103	Fecal Coliform (sediment #/100gm	•				1700						
19   1   9   1   10   2   2   2   2   2   2   2   2   2	FIELD OBSERVATIONS									440000000000000000000000000000000000000		
C)+-         4.5         9.4         2.2           nhos/cm)         2.86         316         329         7.93         7.9	Temperature (° C)		7.3					* 1.61	9.1	10.2		7,2
1192   7.15   7.98   7.93	Temp-cooled (° C)+-	4.5		9.4			2.2				3.3	
Inflos/cm)     296     316     329     868     456     9950     8900       Ef     effluent sample     Action Feathers     Action Foods Incentified     Action Fo	Hd	7.49	7.07	6.87			11.92	7.15	7.98	7.93	8 00	7.26
Ef effluent sample  E cology sample  M Marysville sample  AM Marysville Backwash effluent sample  BackWash Marysville Backwash effluent sample  G The result was greater than the value reported. The result is a minimum value.  J The analyte was positively identified. The associated numerical result is an estimate.  Food Nation Foods Inc. effluent sample  Commercial  Commerci	Conductivity (umhos/cm)	296	316	329			898	456	9950	8900	8500	319
Ef effluent sample       PCFeath       Pacific Feathers Company effluent sample       comp         E Ecology sample       QC       Quil Ceda Tanning Company effluent sample       grab         M       Marysville sample       BackWash       Marysville Backwash effluent sample       #         f-BIk       Effluent Transfer blank       G       The result was greater than the value reported. The result is a minimum value.         ludge       Pond#4 bottom sludge sample       J       The analyte was positively identified. The associated numerical result is an estimate.         Food       Nation Foods Inc. effluent sample       Commonant       Commonant	Chlorme (mg/L)								≤0.01	70.01		
Ecology sample  Marysville sample  BackWash  Marysville Backwash effluent sample  Effluent Transfer blank  Pond#4 bottom sludge sample  J The analyte was positively identified. The associated numerical result is an estimate.  Nation Foods Inc. effluent sample  Compared to Compare the Compared to Compared	田	ė		PCFeath	Pacific Feather	s Company effl	uent sample				Composite sample	
Marysville sample  BackWash Marysville Backwash effluent sample  Effluent Transfer blank  G The result was greater than the value reported. The result is a minimum value.  Pond#4 bottom sludge sample  J The analyte was positively identified. The associated numerical result is an estimate.  Nation Foods Inc. of fluent sample  Compared to Compare the sample		le		9C	Quil Ceda Tan	ming Company	effluent sample				ab sample	
Effluent Transfer blank G Pond#4 bottom sludge sample J Nation Foods Inc. effluent sample		nple		BackWash	Marysville Bac	ckwash effluent	sample			**	it wt.	
Pond#4 bottom sludge sample  Nation Foods Inc. effluent sample		fer blank		G	The result was	greater than the	value reported	. The result is a 1	ninimum value			
Nation Foods Inc. offinent sample		n sludge sample		-	The analyte wa	as positively ide	ntified. The ass	ociated numerica	ıl result is an es	timate.		
ration tools like thinging sample	Nat-Food Nation Foods	Inc. effluent sample		comp-grab	Composite gra-	b sample						

Table 2 - General Chemistry Percent Reduction -	y Percent Re		Marysville Class II, 1996.	, 1996.			Page 1	
Parameter Location:	Inf-E	Ef-AerCell	Percent Reduction	Ef-Pond#2	Percent Reduction	Ef-Pond#4	Percent Reduction	
Type:	comp	comp	Across	grab	Across	grab	Across	
Date:	03/2-6	03/5-6	1st & 2nd	03/5	1st & 2nd	03/5	3rd & 4th	
Time:	08:00-08:00	08:00-08:00	Aeration Cells	1715	Treatment Ponds	1740	Treatment Ponds	
Lab Log #:	108232	108234	(assumes steady state)	108235	(assumes steady state)	108236	(assumes steady state)	
GENERAL CHEMISTRY								
Conductivity (unhos/cm)	483	487	4.83%	477	2.1%	467	2.1%	
Alkalinity (mg/L CaCO3)	153	149	2.6%	146	2.0%	141	3,4%	
SOLIDS								
TS (mg/L)	528	339	36%	380	.12%	305	26%	
TNVS (mg/L)	204	315	-54%	212	33%	175	17%	
TSS (mg/L)	161	80	58%	54	33%	63	-17%	
TNVSS (mg/L)	19	11	42%	3	73%	5	-67%	
OXYGEN DEMAND PARAMETERS								
BOD5 (mg/L)	262	126	52%	41	67.5%	65.4 #	<b>₹009</b> ~	
CBOD5 (inhibited -mg/L)	185							
BOD5 (Soluable -mg/L)	>17.6	>17 G		5	¥ 71%	5	0.000	
TOC (water mg/L)	92.4	57.1	38%	53	7.2%	50.5	4.72%	
NUTRIENTS								
Total Kjeldahl Nitrogen (TKN) (mg'L)	27	23.4	13%	26.2	-12%s	24.7	5.73%	
NH3-N (mg/L)	18	16	11%	16		16		
NO2+NO3-N (mg/L)	0.387	0.132	66%	0.01 U	92%	0.086		
Total-P (mg/L)	4.96	4.02	19%	4.08	-1.5%	3.91	4.2%	
FIELD OBSERVATIONS								
Conductivity (umhos/cm)	291	283	2.7%	315	-11%	319	-1%	
Inf influent sample		G The re	The result was greater than the value renorted. The result is a minimum value	lue renorted. The res	ult is a minimum value			
		U The an	The analyte was not detected at or above the reported result	above the reported	result,			
		comp Compo	Composite sample	•				
	ple	grab Grab sample	umple			,		
Et-Pond#4 Pond #4 effluent sample	ple	m sull #	easured result (29 mg/L) is	suspect and a calcu	This measured result (29 mg/L) is suspect and a calculated result of $65.4  \mathrm{mg/L}$ is used in the report.	f in the report.		

Table 2 - General Chemistry Percent Reduction - Marysville Class II, 1996.	nemistry P	ercent Redu	ction - Mar	ysville Class II	, 1996.				Page 2
Parameter	Location:	Filter	Percent	Percent Reduction	Ef-E	Ecology	Inf-M	Ef-M	Marysville
	Type:	grab	In Load	(Total Load)	comp	Percent Reduction	comp	comp	Percent Reduction
	Date:	03/5	Across S	Sand Filter*	03/5-6	In Load	03/5-6	03/5-6	In Load
,	Time:	1040			08:00-08:00	Across	08:00-08:00	08:00-08:00	Across
	Lab Log #:	108237			108240	Treatment Plant	108233	108242	Treatment plant
GENERAL CHEMISTRY		2000000			****			38888	
Conductivity (umbos/cm)		468	-0.21%	( +6.06% )					
Alkalinity (mg/L CaCO3)		103	27%	( 7.3% )					
SOLDS									
TS (mg/L)		274	147%	( 2.7% )	303	9/4†7			
TNVS (mg/L)		195	-11%	( -3.1% )	184	13%			
TSS (mg/L)		22	63%	( 18% )	47	9/.92		51	74%#
TNVSS (mg/L)		9	-20%	( -5.4% )	4	80%			
OXYGEN DEMAND PARAMETERS	ETERS								
BOD5 (mg/L)		27	58.7%	(15.9%)	53	%#8	249	27	899%
(CBOD5 (inhibited -mg/L)					48	75%	189	16	92%
BOD5 (Soluable -mg/L)		4 U	> 20%	( 5.4% )					
TOC (water mg/L)		30.6			39.3	29%			
NUTRIENTS									
Total Kjeldahl Nitrogen (TKN) (mg/L.	N) (mg/L)	15.1	39%	( 10%)	6.61	299%			
NH3-N (mg/L)		14	13%	( 3.4% )	15	19%			
NO2+NO3-N (mg/L)		1.7	-1877%	( -507% )	898.0	-117%			
Total-P (mg/L)		1.57	%09	( 16% )	3.05	40%			
FIELD OBSERVATIONS									
Conductivity (umhos/cm)		316	0.9%	(-0.25%)	296	1.4%	341	329	6%a
Inf	influent sample		G Th	e result was greater tha	n the value reported.	he result was greater than the value reported. The result is a minimum value	alue.		
	effluent sample		Ē,	The analyte was not detected at or above the reported result.	ted at or above the re	ported result.		duoo	Composite sample
	Ecology sample Marysville sample	<u>u</u>	t Po	ad based on percent of J proximately 27 % of eff	Fond#4 effluent dive	Load based on percent of Fond#4 effluent diverted to filter. Marysville reports that annroximately 27 % of effluent flow (1.24 MGD) is made in of filter effluent	ports that nent	grab	Orab sample
		ł		otal load) is that percent	t load of the total effl	(Total load) is that percent load of the total effluent dicharged from the plant.	ant.		
			# Ec	cology Influent quantity used in percent load calculation	used in percent load	calculation.			
			_	Calculation is based on 65.4 mg/L sand litter influent load	4 mg/L sand litter ii	nilueni load			

İ	lTable 3 -	State	Waste	Discharge	Permit	Com	narisons :	- Marv	sville	Class	IIIn	spection.	1996
	A CONTO		11 4500	TO TO CHARTE -	A CHARRIC		Deer IDOXID	1 T.B. C. B. B. Y	STREET			SPECTOM	1//

	State Waste Discharge		<b>Inspection Results</b>
Parameter	Permit Limits	Location:	Nat-Food
		Туре:	comp
	Daily	Date:	0015 6
	Maximum	Time:	08:00-08:00
		Lab Log#:	108245
Discharge Total BOD <sub>5</sub> Interim Limits*			
Concentration: (mg/L) Loading: (lbs/day)	1500 700		820 G 281
Final Limits**			
Concentration: (mg/L)	300		820 G
Discharge TSS			
Interim & Final Limits Concentration (mg/L)	350		83
Interim & Final Discharge Flow (gal/day)	122,000		41,040
pН			
	7.0 - 11.0		11.92

	State Waste Discharge		Inspection Results
Parameter	Permit Limits	Location:	TO COLET 1
		Type:	grab-comp
	Daily	Date:	03/5&6
	Maximum	Time:	1512
		Lab Log#:	108246
Discharge BOD <sub>5</sub>			
Concentration (mg/L)	300		318
Discharge TSS			
Concentration (mg/L)	350		281
Discharge Flow			
(gal/day)	122,000		52,783

	State Wast	te Discharge		Inspe	ection Results	}
Parameter	1	t Limits	Location:	Ef-QC	Ef-QC-1	. Ef-QC-2
			Type:	comp	grab	grab
	Montly	Daily	Date:	03/5&6	03/5	03/5
	Average	Maximum	Time:	08:00-08:00	1620	1345.
			Lab Log#:	108249	108249	108249
Discharge BOD5 Concentration: (mg/L)		300		373		
Discharge TSS						
Concentration (mg/L)		350		60		
Discharge Flow						
(gal/day)		122,000		10,300		
Sulfide						
Concentration (mg/L)		24.0			1.2	1.5
Oil & Grease						
Concentration (mg/L)		100			8 J	10 J
pН						
	7.0	- 11.0		8.00	7.98	7.93
Chromium						
Concentration (mg/L)	8	12		0.515	1	

Nat-Food	National Foods, Inc. effluent sample
PCFeath	Pacific Coast Feathers Co. effluent sample
Ef-QC	Quil Ceda Tanning Company effluent sample
comp	Ecology composite sample
grab	Ecology grab sample.
grab-comp	Ecology grab composite sample.

- The analyte was positively identified. The associated numerical result is an estimate.
- G The result was greater than the value reported. The result is a minimum value.
- \* Effective date expires June 30, 1996
- \*\* Effective date begins July 1, 1996

	NPDES Permit										
Parameter	Effluent Limits	·····		Eco	Ecology	Mary	Marysville		Ec.	Ecology	
			Location:	Inf-E	Ef-E	Inf-M	Ef-M	Ef.E. 1	Ef-E-2	Ef-EGrab1	EF-EGrab2
			Type:	comp	comp	comp	comp	grab	grab	grab	grab
	Monthly	Weekly	Date:		03/2-6	03/2-6	03/5-6	03/5	03/5	9/80	9/60
	Average	Average L	Time:	08:00-08:00 108232	08:00-08:00 108240	08:00-08:00 108233	08:00-08:00 108242	1200 108238	1810 108239	1100 108252	1810 108253
Effluent Carbonaceous Biochemical Oxygen Demand (CBOD5)			ı					TREATMENT AND THE TREATMENT AN			
Concentration (mg/L)	. 25	40			48. 1533						
Loading: (Ibs/day)	7/71	507					* 110				
Percent Reduction	≥85% Monthly averages shall not exceed 25 mg L or 15% of influent monthly average	d 25 mg L. verage			82%		94%				
Effluent TSS											
For Flow ≤ 2.8 MGD											
Concentration (mg/L) Loading: (lbs/dav)	75 1757	2627									
For Flow > 2.8 MGD							· ·				
Concentration (mg/L)	30	45			47		- 15	7	33		
Loading: (lbs/day)	826	1238			1501 *		1,629 *	1,405 *	1,054 *		
Percent Reduction	≥85% Monthly averages shall not exceed 25 mg/L or 15% of influent monthly average	d 25 mg/L verage			76%		74%	280%	83%		
Effluent Fecal Coliform Concentration (count 100 mL)	200	007								3	3 U
Effluent pH (S.U.)	0.0 < Hq < 0.0				7,49		6.87		7.21	7,34	7.12
Influent Flow Overloading Limits (MGD)	6.1			3.95		4.03					
Influent BODs Overloading Limits						Q. C					
(lbs/day)	10200			8,631 **		8,203 **					
E Ecology 4-hour M Marysville 24-ho Inf Influent sample Ef Efluent sample	Ecology 4-hour composite sample Marysville 24-hour composite sample Influent sample Efluent sample	iii iii	Ef-EGrabl Ef-EGrab2 **	AM effluent fec PM effluent fec Load calculated Load calculated	AM effluent fecal colitorn sample PM effluent fecal colitorn sample Load calculated from an average e Load calculated from an March 5-	ole le effluent flow of 5-6 influent flow	AM effluent fecal coliforn sample PM effluent fecal coliforn sample Load calculated from an average effluent flow of 3.84 MGD recorded 3/3-6/96. Load calculated from an March 5-6 influent flow of 3.95 MGD recorded 3/4-6/96.	ted 3/3-6/96. orded 3/4-6/96.			
comp Composite sample grab Ecology grab sample.	ole mple.										

Parameter Location:		Inf-E-2	Ef-E-1	Ef-E-2			EP.	A/Ecology V	EPA/Ecology Water Quality	<b>&gt;</b>	Sludge	Ef-QC-1	Ef-QC-2
Type:		grab	grab	grab		1	-	æ	Summary		grab	grab	grab
Date: Time: Lab Log#:	03/5 0930 10823	03/5 1650 108231	03/5 1200 108238	03/5 1810 108239			Acute Fresh	Chronic Fresh	Acute Marine	Chronic Marine	03/5 1810 108244	03/5 1620 108247	03/5 1345 108248
VOA Compounds	η/gη	ηg/L	µg/L				μg/L	µg/L	T/S#	µg/L	μg/Kg-dry wt.	µg/L	µg/L
Methylene Chloride		251 1					11,000 *(a)		12,000 *(a)	6,400 *(a)			
Acetone	+ + 0						11 800 60					52700 I	58800 I
Chloroform		7 7	1 7 U	- 77 - T			11,000 *(b) 70,000 *	* 070 -	224,000 *(b)	7 V V Y			
Circlotorio	7.7	0.0	r 0.0	د. لار. ت د			28,900 18,000 *ca	1,440	12,000 (a)	0,400 (4)			
Bromodichloromethane	0.3 J						11,000 *(a)		12.000 *(a)	6.400 *(a)			
Trichloroethene	0.3 J	0.31 J					333	21,900 *	2,000 *	`			
Tetrachloroethene	0.69 J	0.98 J						840 *	10,200 *	450 *			
Toluene	1.7	20	0.07.1			****	17,500 *		* 008.9	\$ 000			
Ethylbenzene	0.11 J	0.55 J					32,000 *		430 *				
1.2,4-Trimethylbenzene 0.67 J	0.67.3	- 26									£ £ 6		
1,3,5-Trimethylbenzene	0.2 J	7.4		200000000000000000000000000000000000000				1			13 J		
sec-Butylbenzene	,	0.26 J											
p-Isopropyltoluene	0.38 J	0.75 J					900				12 J		
1,4-Dichlorobenzene	0.56 J	F 160					1,120 *(h)	763 *(h)	1,970 *(h)		50 J		
1,2-Dichlorobenzene	000000000000000000000000000000000000000	0.13 J		000000000000000000000000000000000000000			1,120 *(h)	/63 *(h)	1,9 /0 *(h)				
Naphthalene   v		107					z,30U *	* 070	* 0007		i C		
o-Xylene		5.3 5.5									5 J		
2		۲. ۲											
Parameter Location:		Inf-E			Ef-E	Trnsf-Bl	EP.	A/Ecology V	EPA/Ecology Water Quality	<b>&gt;</b>	Sludge		Ef-Oc
Type:		comp			comp	grab		Criteria Summary	ummary	OF CATALOGUE MERCAL PROJECTIONS OF THE PROPERTY OF THE PROPERT	grab		comp
Date:		03/5-6	9		03/5-6	03/4	Acute	Chronic	Acute	Chronic	03/5		03/5-6
Time:		08:00-03	08:00-08:00 108223		08:00-08:0	1310	Fresh	Fresh	Marine	Marine	1810		108:00-08:00
		1002.	76		108240	108243					100244		108249
BNA Compounds		ηg/L			$\mu g/\Gamma$	hg/L	µg/L	µg/L	$\mu g/\Gamma$	η/gη	μg/Kg-dry wt.		T/gn
Benzoic Acid		230 J	1		0.87.1								122 I
Isophorone					0.25	:	117,000 *		12,900 *		553 J		
Naphthalene		0.44 444			0.03 J	0.037 J	2,300 *	620 *	2,350 *		173 J		1,2
2-Methylnaphthalene		0.24			0.02 J	0.077 J					65 J		0.086 J
Benzyl Alcohol		6											
4-Methylphenol	ennennen en e	28									930 J		
1,4-Dichlorobenzene		9.04					1,120 *(h)	763 *(ħ)	763 *@) 1,970 *(h)		) (		
4-Chloroaniline	000000000000000000000000000000000000000	***************************************	200000000000000000000000000000000000000	000000000000000000000000000000000000000	C	200000000000000000000000000000000000000			1		825 J		**************************************
Phenol		<del></del>			0.22		10,200 *	2,560 *	* 008.5		,		0.49
Pyrene						1 210 0	* 000 €		300 *(n)	• •	f 987		
Fraudannene 1.Methylnanhthalene		010							<b>7</b>	2	r 770		0.073.1
1-ivicuiyiiiapiiulaisiis   2B Conroctanol		300.1			0.4.1	7,010.0					OUSCO		r C/O'O
Caffeine		41			t o						ONC / K		
Ef Effluent sample	ple	Sludge	Pond slud	Pond sludge sample					grab (	Grab sample	C	Total Trichloroethanes	oethanes
	iple	dwoo	Composite sample	e sample						Total Halomethanes	Ч	Total Dichlorobenzenes	penzenes
E Ecology sample	nple		Тће герог	ted result is a	n estimate beca	use of the pre	The reported result is an estimate because of the presence of interference.	ence.	<b>.</b>	Total Dichloroethenes	n	otal Polynucle	Total Polynuclear Aromatic Hydrocarbons
QC Quil Ceda T	anning Cor	Quil Ceda Tanning Company sample.	The analy	The analyte was positively		The associate	identified. The associated numerical result is an estimate.	ılt is an estima					
Trnsf-Blk Effluent transfer blank sample.	ısfer blank	sample. *	Insufficier	Insufficient data to develop		'alue presente	criteria. Value presented is the LOEL - Lowest Observed Effect Level.	Lowest Obser	ved Effect Level				********
•													

Table 5 - Detected VOAs and BNAs - Marysville Class II, 1996.

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Parameter	Location:	Inf-E		Ef-E	EP.	VEcology W	EPA/Ecology Water Quality		Sludge		Ef-QC
gavannoven.	Type:	comp		comp		Criteria Summary	ımmary		grab		comp
	Date:	03/5-6		03/5-6	Acute	Chronic	Acute	Chronic	03/5		03/5-6
	Time:	08:00-08:0	00	08:00-08:00	Fresh	Fresh	Marine	Marine	1810		08:00-08:00
	Lab Log#:	108232		108240					108244		108249
Metals		T/gnl		hg/L	µg/L	Т/в́н	µg/L	µg/L	mg/Kg-dry wt.		µg/L
Hardness =	= 53			Art day of the second							
Arsenic					360.0 (c)	190.0 (d)	(c) 0.69	36.0 (d)	11.9		
Beryllium					130.0 *	5.3 *			0.32		
Cadmium		0.39		0.2	1.7 +(c)	0.6 +(d)	37.2 (c)	8.0 (d)	3.41		
Chromium (Total)	Total)	8.6							254		515
<del></del>	Hexavalent				16.0 (c)	11.0 (d)	1,100 (c)	50.0 (d)			
	Trivalent				1,032 + (c)	123.1 +(d)	10,300 *(c)				
Copper		46		10	8.4 +(c)	5.9 +(d)	2.5 (c)		234		8.9
Lead		6.7 J		1.9 J		0.97 +(d)	151.0 (c)	5.8 (d)	139		
Mercury (Total	(tal)	0.13			2.4 (c)	0.012 (d)	2.1 (c)	0.025 (d)	1.57		
Nickel		3.7		3	3	87.0 +(d)	71.0 (c)	7.9 (d)	53.8		17.7
Selenium					20.0	5.0	300.0	71.0	17.5		
Silver		1.1			0.7 + (a)		1.2 (a)		10.6		
Zinc		72.5		17	(5)+ (7)	55.1 +(d)	85.0 (c)	77.0 (d)	465		30
Ef	Effluent sample	I I	he analyte was positive	The analyte was positively identified. The associated numerical result is an estimate	1 numerical resu	It is an estimate				And december of the control of the c	
Inf	Influent sample	* In	insufficient data to develop	op criteria. Value presented is the LOEL - Lowest Observed Effect Level.	d is the LOEL -	Lowest Observe	ed Effect Level.				
ы	Ecology sample	+	Hardness dependent criteria (53 mg/L used).	rria (53 mg/L used).							
<u>ح</u>	Quil Ceda Tanning Company sample.	ပ	1-hour average concer	A 1-hour average concentration not to be exceeded more than once	nore than once						
comp	Composite sample	e,	every three years on the average.	average.							
grab	Grab sample	d A	4-day average concent	A 4-day average concentration not to be exceeded more than once	ore than once						
		6	every three years on the average.	average.							
		a A	n instantaneous concen	An instantaneous concentration, not to be exceeded at any time.	at any time.						

### Table 7 - Effluent Bioassay Results - Marysville Class II, 1996

NOTE: tests were run effluent prior to chlorine contact chamber (Ef-Bio: Lab Log #108241)

## Daphnia magna - 48-hour survival test

(Daphnia magna)

Sample	Number Tested *		Percent Survival
Control	20		100
6.25 % Effluent	20		100
12.5 % Effluent	20		100
25 % Effluent	20		100
50 % Effluent	20		100
100 % Effluent	20		95
		Surv	ival

LC50 Could not be calculated LOEC > 100 % effluent NOEC > 100 % effluent

#### Fathead Minnow - 7 day survival and growth test

(Pimephales promelas)

Sample	Number Tested *	Percent Survival	Average Dry Weight per Fish (mg)
Control	40	97.5%	0.488
6.25 % Effluent	40	95.0%	0.401
12.5 % Effluent	40	95.0%	0.349
25 % Effluent	40	75.0%	0.339
50 % Effluent 100 % Effluent	40 40	75.0% 75.0% 10.0%	0.349 0.322

Survival	Growth
LC50 = 57.7 % effluent	
LOEC = 25 % effluent	LOEC = 12.5 % effluent
NOEC = 12.5 % effluent	NOEC = 6.25 % effluent
IC <sub>P</sub> = Not calculated	ICp = 10.5%

#### \* four replicates of 10 organisms

NOEC	No observable effects concentration
LOEC	Lowest observable effects concentration
LC50	Lethal concentration for 50% of the organisms
$IC_P$	Inhibition Concentration $25/50\%$ - the dilution concentration at which the exposed
	population showed a 25/50% growth inhibition

<sup>\* 4</sup> replicates of 5 organisms

Table 8 -	Split Samp	Table 8 - Split Sample Result Comparison - Marysville Class II, 1995	arison - Ma	rysville Class	s II, 1995						
		Location: Inf-E	Inf-M comp 03/5-6 00 08:00-08:00 108233	Ef-Pond#4(E) grab 03/6 1100 108236	EF-Pond#4(M) grab-comp 03/5-6	Filter(E) grab 3/5 1040 108237	Filter(M) grab-comp 3/6	Ef-E comp 03/5-6 08:00-08:00 108240	Ef-M comp 03/5-6 08:00-08:00 108242	PCFeath(E) comp-grab 03/5&6 1512 108246	PCFeath(PCF) grab 03/6
General Chemistry	,										
Parameter Tes	Laboratory	ory 100		œ.	27	çç	1.0	£.R	Ţ,		
(J/gm)	Ecology Marysville	<u>ə</u>	280	co Co	co.	77	X	4.7	21 49 *		
<u>BOD5</u> (mg/L)	Ecology Marysville	262 lle 251	249 233					53	27. 22.7		
CBOD5 (mg/L)	Ecology Marysville	185 le 183	189 203					48	16 11.7		
Ha	Ecatogy Marysville	8.74 le 7.42	<b>7.84</b> 7.02					7.49	6.87 7.14 **		
TSS	Ecology PCFeather	¥								281	277
BODs	Ecology PCFeather	х								318	230
Oil & Grease	se Ecology PCFeather	X								55	156
E M PCF grab comp EF Inf	Ecology sample Marysville sample Pacific Coast Feathers Inc. grab sample Composite sample Effluent sample	ple **		Flow weighted combination of fiter and pond#4 effluent.  Negative log <sub>10</sub> of the final concentration drived from the addition of hydrogen ion loads from the filter and the the 4th lagoon.	and pond#4 effluent. ition drived from the	addition of hydr	ogen ion loads				

and to the Dangerous Waste Concentration Thresholds- Marysville Class II, 1996 Table 9 - Sludge Result Comparisons to the EPA Land Application Concentration Criteria

Parameter	Location:	Sludge	Volumetric	EPA Standards for Land Application	Land Application	Dangerous Waste Regulations	te Regulations
	Туре:	grab	Concentration	of Sewag	of Sewage Sludge	Designation Criteria	ı Criteria
	Date:	03/5	Jo			Toxicity	Screening
	Time:	1810	Parameters $^{ ilde{ heta}}$	Ceiling Concentrations *	Pollutant Concentrations **	Charascteristics	Concentrations#
	Lab Log #:	108244				List +	(20 Times)
VOA Compounds		μg/Kg-dry wt.	mg/L			(mg/L)	(mg/L)
1,4-Dicclorobenzene		Z0 J	0.002	NA	MA	7.5	150
Metals	I)	(mg/Kg-dry wt.)	(mg/L)	(mg/Kg-dry wt.)	(mg/Kg-dry wt.)	(mg/L)	(mg/L)
Arsenic		11.9	1.37	75	41	5.0	100.0
Chromort Conner		254 234	29.2	85 3000 4200	39 1200 1500	5.0	0.07 106.0
Copper Lead Mercury (Total)		139	16.0	840	300	5.0	196.0 4.0
Mickel Selenium		53.8	2.02	420	420 36	0 -	N.A. 20.0
Silver		10.6 465	1.22	N.A 7500	N.A. 2800	2.0	100.0 N.A.

Ceiling concentration limit for bulk sewage sludge or for sewage sludge sold or given away in a bag or other container.

Pollutant concentration limit of bulk sewage sludge if it is applied to agricultural land, forest land, a public contact site, or a reclaimation site.

Maximum concentration of the contaminates for the leachate extract toxicity characteristic.

Screening concentration criteria of parameter which recommends that such wastes be designated by test methods set forth in WAC 173-303-110.

Wet weight concentration of parameter converted to volumetric concentration assumming a sludge specific gravity of 1.01.

Sludge Marysville Pond#4 bottom sludge sample

A. Not Applicable

**Appendices** 

		-	

## Appendix A - Sampling Stations Descriptions - Marysville Class II, 1996

Inf-E-#	Ecology grab samples of Marysville influent wastewater collected from the channel just above the influent Parshall flume. Collected 03/5/96 in both A.M. and P.M.
Inf-E	Ecology 24-hour composite sample of Marysville influent wastewater collected from the channel just above the influent Parshall flume. Collected 03/5-6/96
Inf-M	Marysville 24-hour composite sample of Marysville influent wastewater collected from the channel just above the influent Parshall flume. Collected 03/5-6/96
Ef-AerCell	Ecology 24-hour composite sample of Marysville in-plant wastewater collected from the channel draining the two complete mix aeration cell into oxidation pond #1. Collected 03/5-6/96.
Ef-Pond#2	Ecology grab sample of Marysville in-plant wastewater collected from the culvert draining oxidation pond #2 into polishing pond #3. Collected 03/5/96 in the P.M.
Ef-Pond#4	Ecology grab sample of Marysville in-plant wastewater collected from the pump wet well for the outflow of polishing pond #4, upstream of the sand filters and the chlorine contact chamber. Collected 03/5/96 in the P.M.
Filter	Ecology grab sample of Marysville in-plant wastewater collected from the pump wet well for the outflow from the sand filter to the chlorine contact chamber. Collected 03/5/96 in the A.M.
Ef-E-#	Ecology grab samples of Marysville effluent wastewater collected above the weir at the end of the chlorine contact chamber, just prior to final discharge. Collected 03/5/96 in both A.M. and P.M.
Ef-EGrab#	Ecology fecal coliform grab samples of Marysville effluent wastewater collected above the weir at the end of the chlorine contact chamber, just prior to final discharge. Collected 03/6/96 in both A.M. and P.M.
Ef-E	Ecology 24-hour composite sample of Marysville effluent wastewater collected above the weir at the end of the chlorine contact chamber, just prior to final discharge. Collected 03/5-6/96.
Ef-Bio	Three-part Ecology bioassay grab-composite sample of Marysville unchlorinated effluent collected from manhole just after the convergence of sand filter effluent and the remainder of pond#4 effluent, prior to the chlorine contact chamber. One portion collected on 03/05/96 and two others on 03/06/96.
Ef-M	Marysville grab-composite samples of in-plant wastewater collected from the end of pond#4 and the effluent from the sand filter, then combined to represent the final effluent for analysis. Collected 03/05-6/96.
Transblk	Ecology grab sample of effluent compositor distilled rinse Collected 03/04/96.
Sludge	Ecology grab-composite sample of Marysville lagoon bottom sludge collected by petite ponar from a boat at the upper (south) end of lagoon #4 Collected 03/5/96 in the P.M.
Nat-Food	Ecology 24-hour composite sample of National Foods, Inc. effluent discharge to the Marysville collection system, collected from a manhole just prior to discharge to the city collection system Collected 03/5-6/96.
PCFeath	Ecology grab-composite sample of Pacific Coast Feathers Company effluent discharge to the Marysville collection system, collected from a grease trap just prior to the city collection system Collected 03/5-6/96.

- Ef-QC-# Ecology grab samples of Quil Ceda Tanning Company effluent discharge to the Marysville collection system, collected from the final effluent treatment tank, just prior to discharge to the city collection system. Collected 03/5-6/96 one in the PM and one in the AM.
- **Ef-QC-#** Ecology 24-hour composite sample of Quil Ceda Tanning Company effluent discharge to the Marysville collection system, collected from the final effluent treatment tank, just prior to discharge to the city collection system. Collected 03/5-6/96.
- Backwash Ecology grab sample of Marysville sand filter backwash collected from pump wet well, just prior to recirculation to oxidation lagoons #1 & #2. Collected 03/05/96

Parameter Location:	tion:	Inf-E-1	Inf-E-2	Inf-E	Inf-M	Ef-AerCell	Ef-Pond#2	Ef-Pond#4	Filter	Ef-E-1	Ef-E-2	Ef-EGrab1	EF-EGrab2
	Type:	grab	grab	comp	comp	comp	grab	grab	grab	grab	grab	grab	grab
T 1	Date: Time:	03/5	03/5	03/5-6	03/5-6	03/5-6		03/5	03/5	03/5	03/5	03/6	03/6
Lab Log #:	og #:	108230	108231	108232				108236	108237	108238	108239	108252	108253
CHEMISTRY													
<b>11</b> 2.		<b>M</b>	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	LL LL		E T	n jii	E E E E		E	ш	E E	
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TNVSS				Э		ш		E	Е				
olids				86 86 86 88 88									
OXYGEN DEMAND PARAMETERS	ETERS	**************************************	independent de la company										
BODS (total)						E	щ	Ħ	E				
CBODS (inhibited) BODS (Schikle)				E&M	E&M	4	12	4	ū				
stat (cannon) DC (water)				33		T.	F.	**************************************	Ŧ				
TOC (soil/sed)	1000			ı		ı	ì	ı	ı				
UTRIENTS													
Total Kjeldahi Nitrogen (TKN)				Ξ		E	ш	щ	<b>3</b>				
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Oil and Grease (water)		Э	H							E	Э		
F-Coliform MF												ΙTÌ	П
f-Coliform (soil/sed)													
ORGANICS	annound supplementation of the supplementatio				Promote de la company de la co					*domination of the control of the co			
VOC (water)		7	7							**	<b>1</b> 2		
VOC (soll/sed) - Extensive 11Cs BN de fragtest			<u> </u>	4									
BNAs (soil/sed) - Extensive TICs				I									
Pest/PCB (water) - Chlorinated			Ŧ	E									
st/PCB (soil/sed) - Chlorinated													
METALS PP Metals (water)				а									
PP Metals (soil/sed)													
BIOASSAYS	200200000000000000000000000000000000000								possionessessessessessessessessessesses				
Daplinia magna (acute)													
FIELD OBSERVATIONS												•	
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		د	د	د			٦	i.	٦		1	1 <b>tt</b>	E C
Inf influent sample	ample		EI	Ef-Pond#4 Pc	Pond #4 effluent sample	mple	+	Refrigerated sample	nple				
Ef effluent sample E Ecology sample M Marysville sam	ample sample a le sample	effluent sample Ecology sample and Analysis Marysville sample and Analysis		Filter PI Ef-EGrab1 Al Ef-EGrab2 PN	Plant filter effluent sample AM effluent fecal coliforn sample PM effluent fecal coliforn sample	sample oliforn sample oliforn sample							
Ef-AerCell Aeration cell effluent san	cell efflu	Aeration cell effluent sample			Composite sample								
	offliant c	olumo.		orsh G	Grap cample								

Appendix B - Sam	Sampling Schedule - Marysville Class II, 1996.	lule - Mary	sville Clas	s II, 1996.								Page 2
Parameter	Location:	Ef-E	Ef-Bio	Ef-M	Trnsf-Blk	Sludge	Nat-Food	PCFeath	Ef-QC-1	Ef-QC-2	Ef-QC	BackWash
	Type: Date: Time: Lab Log #:	comp 03/5-6 08:00-08:00 108240	grab-comp 03/5 0910 108241	comp 03/5-6 08:00-08:00 108242	grab 03/4 1310 108243	grab 03/5 1810 108244	comp 03/5-6 08:00-08:00 108245	comp-grab 03/5&6 1512 108246	grab 03/5 1620 108247	grab 03/5 1345 1E+05	comp 03/5-6 08:00-08:00 108249	grab 03/5 1100 108251
GENERAL CHEMISTRY Conductivity Alkalimity Hardness Sulfide		<b>3</b>	ш	Market Market			E	■ 19,000 99999		tH 11	E E E E	E E
SI	а	E							į	1		я
TNVS TSS TNVSS		3333	E E	E&M			<b>14.3</b>	E&PCF	<b>.</b>	ш	E	Э <b>Ж</b> Э
% Solids % Volatile Solids						<b>3</b>						
OXYGEN DEMAND PARAMETERS BODS (total)	<u>AMETEKS</u>	E	m) t	3333			m;	E&PCF			æ	Т
ibited) 61e)		ᆈ		E&M			ъ					1
TOC (water)		л					I	<b>a</b>			E	E
NUTRIENTS (Total Kjeldahl Nitrogen (TKN)	•	E				1					ш	£
NH3-N   NO2*NO3-N   Total D		ਜ਼ ਲ ਹ	E B				т ш	可疑。	ப்ஜே		9330	मिस
MISCELLANEOUS Oil and Grease (water)		ı						E&PCF	¥	Œ.		ਧ
F-Coliform Mr F-Coliform Souli (soil) (soil) (soil) (soil)						I						
VOC (water) VOC (coilead), Extensive TICs	8338					٥			M.	B		
BNAs (water)  DNAs (coilled) Extensive TICs	3333	3			а	η t					3	
Post PCB (water) - Extensive 11Cs Post PCB (water) - Chlorinated Post PCB (soil/sed) - Chlorinated		<b>3</b>			E	п ш				3	В	
METALS PP Metals (water) PP Metals (soil/sed)		Æ			E	I					B	
BIOASSAYS Daphuia magna (acute) Fathead Minnow (chronic)	Ħ.		Œ									
Temperature			¥					E	Ī	н		E
Temp-cooled pH Conductivity		я ва	Ħ.a		E E E E E E E E E E E E E E E E E E E		म ह्या स	<b>33</b>	E E	E E	म स्थाप	E
Ef	effluent sample			PCFeath	Pacific Coast Feathers Company effluent sample	eathers Compar	ny effluent sam	ole			Composite sample	
E Ec M M Trnsf-Blk Ef Sludge Pc Nat-Food Ni	Ecology sample and Analysis Marysville sample and Analysis Effluent Transfer blank Pond#4 bottom sludge sample Nation Foods Inc. effluent sample	d Analysis and Analysis lank dge sample effluent sample		PCF QC BackWash comp-grab	Pacific Coast Feathers Company analysis Quil Ceda Tanning Company effluent sample Marysville Backwash effluent sample Composite grab sample	Pacific Coast Feathers Company analysis Quil Ceda Tanning Company effluent san Marysville Backwash effluent sample Composite grab sample	ıy analysis effluent sample sample			grab Gra	Grab sample	

### Appendix C - Laboratory Methods - Marysville Class II, 1996

Parameter	Manchester Methods	APHA Methods	Lab Used
GENERAL CHEMISTR	<u>Y</u>		
Conductivity	EPA, Revised 1983, 120.1	APHA, 1995: 2510A.	Manchester Lab
Alkalinity	EPA, Revised 1983: 310.1	APHA, 1995: 2320B.	Manchester Lab
Hardness	EPA, Revised 1983: 130.2	APHA, 1995: 2340C.	Manchester Lab
Sulfide	EPA, Revised 1983: 376.1		Manchester Lab
SOLIDS			
TS	EPA, Revised 1983: 160 3		Manchester Lab
TNVS	EPA, Revised 1983: 106.3		Manchester Lab
TSS	EPA, Revised 1983 160.2		Manchester Lab
TNVSS	EPA, Revised 1983: 106.2		
% Solids	APHA, 1995: 2540G	APHA, 1995: 2540G.	Manchester Lab
% Volatile Solids	EPA, Revised 1983: 160.4	APHA, 1995: 2540E.	Manchester Lab
OXYGEN DEMAND PA			
BOD5 (total)	EPA, Revised 1983: 405.1		Manchester Lab
CBOD5 (inhibited)	EPA, Revised 1983: 410.1		Manchester Lab
BOD5 (Soluble)		APHA, 1995: 5210B.	Manchester Lab
TOC (water)	EPA, Revised 1983: 415.1		Sound Analytical Services, Inc
TOC (soil/sed)	EPA, Revised 1983: 415.1	APHA, 1995: 5310B.	Sound Analytical Services, Inc
NUTRIENTS	<b>***</b> *********************************	00404045040000408090800404040808080000000000	
Total Kjeldahl Nitrogen (T		ALPA, 1995:4500N <sub>org</sub>	Manchester Lab
NH3-N	EPA, Revised 1983: 350.1		Manchester Lab
NO2+NO3-N	EPA, Revised 1983, 353.2		Manchester Lab
Total-P	EPA, Revised 1983: 365.3	APHA, 1995: 4500-PF.	Manchester Lab
MISCELLANEOUS		antel anne een	04-04-00-00-00-00-00-00-00-00-00-00-00-0
Oil and Grease (water)	EPA, Revised 1983 413.1		Manchester Lab
F-Coliform MF		APHA, 1995: 9221D.	Manchester Lab
F-Coliform (soil/sed)	APHA, 1995: 9221A	APHA, 1995: 9221A.	Manchester Lab
ORGANICS	TDX 1007 PbY0	A TAT T. A. AVAN & C.	
VOC (water) VOC (soil/sed) - Extensiv	EPA, 1986: 8260	APHA, 1995 6	Manchester Lab
	EPA, 1986: 8270	APHA, 1995: 6210B.	Manchester Lab
BNAs (water) BNAs (soil/sed) - Extensiv	EFA, 1980 8270	APHA, 1995: 6410B.	Manchester Lab
Pest/PCB (water) - Chlori		APHA, 1995: 6410B.	Manchester Lab Manchester Lab
Pest/PCB (soil/sed) - Chlo		APHA, 1995 6630C APHA, 1995: 6630C.	Manchester Lab
METALS	EFA, 1900. 0000	AFIIA, 1993. 0030C.	Manchester Lab
PP Metals (water)	EPA, Revised 1983: 200-2	APLIA 1005 2000 250	Manchagter Lab
PP Metals (soil/sed)	EPA, Revised 1983: 200-2		
BIOASSAYS	1.1.11, INCVISCU 1703, 200-2	miles, 1993. 3000 <del>-</del> 330	ivianellestel Lau
Fathead Minnow (acute)	EPA 1993-1000 0	APHA, 1995; 8910B&C	Reak Consultants
Fathead Minnow (chronic)		APHA, 1995: 8910B&C	
i atticad iviiliiow (cilionic)	LL A 1707. 1000.0	ALTIA, 1993. 6910D&C	Deak Consultants

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# Appendix D - Quality Assurance/Quality Control - Marysville Class II Inspection, 1996

#### Priority Pollutant Metal Cleaning Procedures for Wastewater Collection Equipment.

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

ppendix E - VOA, BNA, Pesticide/PCB and Metals Scan Results - Marysville Class II, 1996.		
- VOA, BNA, Pesticide/PCB and Metals Scan Results - Marysville Class II	1996.	
- VOA, BNA, Pesticide/PCB and Metals Scan Results - Marysvi	e Class II	
- VOA, BNA, Pesticide/PCB and M	Marysvi	
- VOA, BNA, Pesticide/PCB and M	Results -	
- VOA, BNA, Pesticide/PCB and M	als Scan	
- VOA, BNA, Pesticid	$\mathbf{Z}$	
- VOA, BNA,	c.	
ppendix E - VOA, BNA,	Pesticid	
ppendix E - VOA	, BNA,	
ppendix E	- VOA	
	ppendix E	

Page 1

× ×							)
Parameter Location:	ion: Inf-E-1	Inf-E-2	Ef-E-1	Ef-E-2	Sludge	Ef-QC-	Ef-QC-2
T,		grab	grab	grab	grab	grab	grab
ũ		03/5	03/5	03/5	03/5	03/5	03/5
II	<b>Time:</b> 0930	1650	1200	1810	1810	1620	1345
Lab Log#:	g#: 108230	108231	10823	108239	108244	108247	108248
VOA Compounds	hg/L	µg/L	µg/L	Цgц	μg/Kg-dry wt.	1/8rl	µg/L
Chloromethane	A T	$\Omega$ I	$\Omega$	î Î	17 (1)	10 11	10 11
Dichlorodifluoromethane	2 UJ	2 UJ	2 UJ	2 UJ		20 ŪJ	20 ŪJ
Bromomethane	n i	1 U	n I	l U		O 01	10 U
Vinyl Chloride	1 U	1 U	1 U	1 U	17 U	10 U	10 UJ
Chloroethane	ΠΙ	n I	n I	1 U		n oi	10 O
Trichlorofluoromethane	2 UJ	2 UJ		2 UJ	17 U	20 UJ	20 UJ
Methylene Chlonde	1.6 UI	2333	1 Dì	l UI	35 U	10 OI	10 UJ
Acetone	20 UJ	20 UJ	20 UJ			2700 I	58800 I
Carbon Disulfide	1 N	1 U		n n	86 UJ	10 OI	10 UJ
1,1-Dichloroethene	1 U	1 U		1 U		÷	0
I, I-Dichloroethane	n I	n n	1 U	nı	17 U	10 U	30000
trans-1,2-Dichloroethene	1 U	1 U	1 U	1 U	8	8	2.
cis-1,2-Dichloroethene	0.3 J	n I	n I	111	17 U	10 ft	10 UJ
2,2-Dichloropropane	1 U	1 U	1 U	1 U	17 U	ŝ	10 U
Bromochloromethane	1 D	1 U		1 U	n 21	10 OI	10 UJ
Chloroform	5.1	9.9	0.55 J	0.54 J		10 U	
1,2-Dichloroethane	)   	n -	n I	n c	17 U	n 0	
I, I, ITrichloroethane	n I	0.4 J	D I	I U		10 U	10 U
Carbon Tetrachloride	n n	1 U	1 n	n n	17 UJ	D 0I	to UI
<ol> <li>1,1-Dichloropropene</li> </ol>	l U	l U	l U	1 U			1
Bromodichloromethane	0,34 J	n I	1 f	ni	17 UJ	10 U	10 UJ
1,2-Dichloropropane	D -	l U	n T	l U	17 U	10 U	
Dibromomethane	1 C	n n	10	n n	17 U	10 OI	
trans-1,3-Dichloropropene		1 U	1 U	1 U		D 01	10 UJ
Inchioroethene	7 67.0	1.51 J	<b>→ −</b>		T/ (1	n 9	
Dibromochloromethane	1 O	l U	n n	1 U	17 UJ	10 U	
1,2-Dibromoethane (EDB)		n n	10	n i	17 U	10 OI	
1,1,2-Trichloroethane	1 U	1 U	1 U	1 U	17 U	10 U	
1,3-Dichloropropane	1 0	1 U	n n	n n	17 U	O 01	10 OI
Benzene	1 U	1 U	l U	1 U	17 UJ		
cts-1,3-Dichloropropene	2 U	2 U	2 U	2 U	18 U	20 U	20 U
Вготобогт	2 U	2 U	2 U	2 U	17 UJ		
2-Hexanone	1 U	1 U	1 U	1 U	69 U	10 U	10 U
	influent sample	grab	Grab sample				
Ef efflu	effluent sample	Π	The reported result is	The reported result is an estimate because of the presence of interference.			
	Ecology sample	ъ	The analyte was positi	lyte was positively identified. The associated numerical result is an estimate.	stimate.		
Sludge Pond	Pond sludge sample	UJ	The anaylte was not d	The anaylte was not detected at or above the reported estimated result.			
QC Quil	Quil Ceda Tanning Company sample	pany sample U	The analyte was not d	lyte was not detected at or above the reported result.			
		,		•			

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SSI
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B and
VOA, BNA, Pesticide/PCB
, Pestic
, BNA
- VOA
cont.)
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Append

Appendix E (c	ont.) - VC	)A, BNA,	, Pesticide/PC	B and Metals Sc.	Appendix E (cont.) - VOA, BNA, Pesticide/PCB and Metals Scan Results - Marysville Class II, 1996.	I, 1996.		Page 2
Parameter	Location:	Inf-E-1	Inf-E-2	Ef-E-1	Ef-E-2	Sludge	Ef-QC-	Ef-QC-2
	Type:	grab	grab	grab	grab	grab	grab	grab
	Date:	03/5	03/5	03/5	03/5	03/5	03/5	03/5
	Time:	0860	1650	1200	1810	1810	1620	1345
<b>_</b>	Lab Log#:	10823	108231	10823	108239	108244	108247	108248
VOA Compounds		hg/L	hg/L	ηgη	T/8n	μg/Kgdry wt.	µg/L	T/8rl
Tetrachloroethene		f 69 0	0.98 J	n I	D.T.	[] []	10 11	
1,1,2,2-Tetrachloroethane	thane	1 U	1 U	1 U	1 U	17 U	10 Ū	10 Ŭ
1,1,1,2-Tetrachloroethane	thane	ΠΠ	1 []	In	1.0	17.0	10 O	10 UJ
Toluene		1.7	20	0.067 J	1 U	17 UJ	10 U	10 UJ
Chlorobenzene		nı	I U	10	1 II	17 U	10 D	10 UJ
Ethylbenzene		0.11 J	0.55 J	1 U	$\frac{1}{1}$ U	17 W	10 U	10 UJ
Вготорепzепе		n T	1 U	ΠI	1.0	17.0	10 01	10 UJ
1,2,3-Trichloropropane	me	1 U	1 U	1 U	1  U	17 UJ	10 U	10 UJ
2-Chlorotoluene		n I	10	10	1.U	17.0	10 U	10 UJ
4-Chlorotoluene		1 U	1 U	1 U	1 U	17 U	10 U	10 UJ
1,2,4-1 rumethylbenzene		0,67 J	26	I II	$1  \mathrm{U}$	9.3 J	10 U	10 UJ
tert-Butylbenzene		D	1 U	1 U	1 0	17 U	10 U	10 UJ
[1,3,5-Trimethylbenzen	ene	0.2 J	7.4	1 0	110	13 J	10 D	10 UJ
sec-Butylbenzene			0.26 J	1 U	$\frac{1}{1}$ U	17 U	10 U	10 UJ
p-Isopropyltoluene		0.38.1	0.75 J	Ωŧ	1.0	12 J	10 O	10 UJ
1,2,3-Trichlorobenzene	ne		1 U	1 U	10	34 UJ	10 U	10 UJ
1,4-Dichlorobenzene		0,56 J	£ 16′0	ΠI	10	20 J	10 ft	10 UI
1,2-Dichlorobenzene			0.13 J		1 U	35 U	10 U	10 UJ
1,2,4-Trichlorobenzen	же	2 UJ	2 UJ	2 UJ	2 UJ	35 UI	20 UJ	20 UJ
Naphthalene*		2 UJ	1.5 J			86 UJ	20 UJ	20 UJ
Hexachlorobutadiene	6).	<u>a</u> 1	11	ΠI	110	35 UJ	10 U	10 UJ
o-Xylene		0.2 J	2.3	1 U	1 U	3 J	10 U	10 UJ
1,3-Dichlorobenzene		ΠI	11	ΩI	10	35 U	ា 0 ប	10 UJ
1,1-Dichloropropanone	ne	10 UJ	10 UJ	10 UJ	10 UJ	N 98	100 UJ	100 UJ
1-Chlorobutane		n I	10	10	10	17 U	10 O	10 U
2-Methyoxy-2-Methylpropane	ylpropane	1 U	1 U	1 U		17 U	10 U	10 U
Acrylonitrile		2 C	$2  \mathrm{UJ}$	2 UJ	2 UJ	35 U	20 UJ	20 UJ
Allyl Chloride		s uj	s UJ	5 UJ		17 U	50 UJ	50 UJ
Chloroacetonitrile		3 Q	2 U	2 U	2 U	0.41	20 U	
Ethyl Ether		1 U	1 U	1 U	1 U	17 U	10 U	10 UJ
Ethylmethacrylate		n n	n n	n I	l U	35 U	10 U	10 UJ
Hexachloroethane		1 U	1 U	U I	1 Ú	17 UJ	10 U	10 UJ
Inf	Influent sample	ple	grab	Grab sample				
Ef	Effluent sample	ple		The reported result is a	The reported result is an estimate because of the presence of interference.			age all grant
П	Ecology sample	ple	ъ,	The analyte was positively identified	ely identified. The associated numerical result is an estimate.	n estimate.		
Sludge	Pond sludge sample	sample	m	The anaylte was not det	The anayite was not detected at or above the reported estimated result.			
óc	Quil Ceda T.	Quil Ceda Tanning Company sample	ny sample U	The analyte was not det	yte was not detected at or above the reported result.			
								Acceptance

Type:         grab grab grab grab (3/5)         grap (3/5)	β grab         grab prob	Ef.E.1 Ef.E.2	CTROCHOCK SPECICAL CAGGACTOROPH SELECTIVE SELE	Sludoe	Ff-OC- Ff-OC-2	
Lab Log#: 10823   10823     Fine: 0336   1650     Fine: 0330   1650     Fine: 0330   1650     Lab Log#: 10823   10823     Metharylate	1	4			,	
Lab Logh:         0.505         0.505           Compounds         log23         1.0523           Compounds         leg'L         leg'L           ethane         leg'L         leg'L           ethane         leg'L         leg'L           acrionitrile         1 U         1 U           d'Mentacylate         2 UJ         2 UJ           1 Methacylate         2 UJ         2 UJ           Albenzene         1 U         1 U           holoretrane         1 U         2.0           holoretrane         1 U         2.0           holoretrane         1 U         1 U           retree         1 U         2.0           Aydrofuran         2 U         2 U           Lab Log#:         1 U         1 U           Compounds         1 U         1 U           Type:         1 U         2 U           Compounds         1 U         1 U           As Asia         1 U         1 U           (a) Pytene         1 U         2 U           (a) Pytene         1 U         1 U           (a) Anthracene         0 U         1 U           (a) Anthracene         0 U <th< td=""><td>  10</td><td></td><td></td><td></td><td></td><td></td></th<>	10					
Lab Log#: 10823 108231   Compounds   Hime: 0930 1030   1030     chaine	1810   1620				_	
Lab Log#:         10823         108231           Compounds         μgT         μgT         μgT           ethane         1 U         1 U         1 U           acrilonitrile         1 U         1 U         1 U           1 Methacrylate         2 UJ         2 UJ           1 Methacrylate         2 UJ         2 UJ           Albenzene         1 U         2.5           vylbenzene         20 U         20 U           senzene         20 U         20 U           senzene         1 U         1 U           witrile         10 U         10 U           vydrofuran         2 U         2 U           Date:         2 U         2 U           Arbeitschlare         1 U         1 U           vydrofuran         2 U         2 U           Date:         2 U         2 U           Compounds         1 U         1 U           Inference         1 U         1 U           (a) Bytene         1 U         1 U <th< td=""><td>  100231   100234   100234   100234   1002444   1002444   1002444   1002444   1002444   1002444   1002</td><td></td><td></td><td></td><td></td><td></td></th<>	100231   100234   100234   100234   1002444   1002444   1002444   1002444   1002444   1002444   1002					
Compounds         hgT         hgT         hgT           ethane         1 U         1 U         1 U           1 acrylate         1 U         1 U         1 U           1 Methacrylate         2 UJ         2 UJ         2 UJ           1 Webaczene         1 U         2 U         2 U           enzene         20 U         20 U         20 U           hhorochlane         1 U         1 U         1 U           hhorochlane         1 U         1 U         1 U           ydrofuran         2 U         2 U         2 U           1 Jybichloro-2-butene         1 U         1 U         1 M           Compounds         1 U         1 U         1 M           Type:         Time:         0 0 17         0 0 17           Compounds         1 U         1 U         0 0 17           Introphenol         2 U         2 U         2 U           Introphenol         3 .5         2 x d         0 0 17           Ex Acid         Introphenol         0 .17           Ex Acid         Introphenol         0 .17           Ex Acid         Introphenol         0 .17           Introphenol         0 .17         0 .17 </td <td>L         μgL         μgL<td></td><td></td><td></td><td></td><td></td></td>	L         μgL         μgL <td></td> <td></td> <td></td> <td></td> <td></td>					
ethane acrilonitrile 1 U 1 U 1 acrylate 1 U 1 U 1 Methacrylate 2 UJ 2 UJ 3 benzene 1 U 2.5 enzene 2 U 2 U 3 by benzene 2 U 2 U 1 d 1 U 1 d 1 U 2.5 enzene 1 U 2.5 enzene 2 U 2 U 3 d 1 d 1 d 1 3 d 1 d 1 4 d 1 d 1	Un         1 U <td></td> <td></td> <td></td> <td>1g/L µg/L</td> <td></td>				1g/L µg/L	
acrilonitrile 1 U 1 U 1 U    acrylate	U         1 U         1 U         1 U         1 U         1 U         1 U         1 U         1 U         1 U         1 U         1 U         2 U         1 U         2 U         1 U         2 U         2 U         1 U         2 U         1 U         2 U         2 U         1 U <td></td> <td></td> <td></td> <td></td> <td></td>					
1 U	U         1 U <td>1 U 1 U</td> <td></td> <td>17 U</td> <td></td> <td></td>	1 U 1 U		17 U		
1 Methacrylate	UI)         2 UI         2 UI         2 UI         1 U         2 U         2					
1 U 2.5	U         1 U <td>UJ</td> <td></td> <td>Ŋ</td> <td></td> <td></td>	UJ		Ŋ		
1 U 2.5   2.0 U   2.0 U   1	U         2.5         1 U         1 U         1 U         N         REJ         200           U         20 U         20 U         1 U         1 U         N         N         100           U         1 U         1 U         1 U         N         N         100           U         2 U <td></td> <td></td> <td></td> <td></td> <td></td>					
Action	U         20 U         20 U         20 U         17 U         17 U         10 U         17 U         10 U         17 U         10 U         17 U         10 U         10 U         17 U         10 U         10 U         17 U         10 U					
Type:   1 U	1				200000000000000000000000000000000000000	
1	10   10   10   10   10   10   10   10			19:		
10 U   10 U   10 U   10 U   10 U   14 Dichlerne   1 U   1	U         10 U         10 U         10 U         20 U			<b>-</b>	01	
ydrofuran         2 U         2 U           1.4-Dichloro-2-butene         1 U         1 L0           Location:         Inf-E           Type:         03/5           Time:         08:00           Time:         08:00           Lab Log#:         0.17           (a)Pyrene         0.17           avo(a,h)Anthracene         0.17           to Actid         0.17           phthiene         0.17           osodiphenylamine         0.17           to Actid         0.17           to Actid         0.17           cols         0.17           Influent sample         0.17 <t< td=""><td>U         2 U<td></td><td></td><td></td><td></td><td></td></td></t<>	U         2 U <td></td> <td></td> <td></td> <td></td> <td></td>					
1.4.Dichloro-2-batene	Ling			Ω	20	
Location:         Inf-E           Type:         Compounds           Time:         Date:         Com3/5-           Compounds         μg/l         (8:00           Compounds         μg/l         (9.17           Compounds         μg/l         (9.17           (a)Pytene         0.17         (9.17           nitrophenol         3.5         20.17           recash/Mathracene         0.17         1           recash/Mathracene         0.17         1           recash/Mathracene         0.17         1           recash/Mathracene         0.17         1           records Anderlaylenne         0.17         1           phtherie         0.17         1           phtherie         0.17         1           sosodiphenylamine         0.17         0.17           osodiphenylamine         0.17         0.17           osodiphenylamine         0.17         0.17           ne         0.17         0.17           osodiphenylamine         0.17         0.17           ne         0.17         0.17           linfluent sample         1         0.17           Effluent sample         1 <th>  Inf-E   Comp   Ef-E   Timsf-Bi   Sludge    </th> <th>n</th> <th></th> <th></th> <th>0 U I0 UI</th> <th></th>	Inf-E   Comp   Ef-E   Timsf-Bi   Sludge	n			0 U I0 UI	
Type:         compounds           Date:         Time:         03/5           Time:         Lab Log#:         1082           Compounds         μg/1           Compounds         μg/1           (a)Pyrene         0.17           mitrophenol         3.5           xo(a,h)Anthracene         0.17           so (a,h)Anthracene         0.17           in cos-3-Methylphenol         0.17           in cost         0.17           in cost         0.17           in cost         0.17           phthiene         0.17           cole         0.17           phthiene         0.17           phthiene         0.17           phthiene         0.17	comp         comp         grab         grab         grab         grab         03/5 <th< th=""><th></th><th></th><th>Sludge</th><th>PORTOR IN THE CHARLES AND AND AND AND AND AND AND AND AND AND</th><th>Ef-OC</th></th<>			Sludge	PORTOR IN THE CHARLES AND	Ef-OC
Date:         Date:         03/5           Time:         Time:         08/0           Compounds         µg/1         1082           Compounds         µg/1         1082           Compounds         0.17         17           antrophenol         3.5         20           antrophenol         0.17         0.17           accall/Anthracene         0.17         0.17           ic Acid         0.17         0.17           ic Acid         0.17         0.17           ic Acid         0.17         0.17           inhoroethane         0.17         0.17           ic Acid         0.17         0.17           phthene         0.17         0.17           phthene         0.17         0.17           osodiphenylamine         0.17         0.17           osodiphenylamine         0.17         0.17           ne         0.17         0.17           inhuent sample         1         Effluent sample         1           Ecology sample         1         0.17           Ecology sample         1         0.17	03/5-6         03/5-6         03/5-6         03/5-6         03/5-7         03/5-6         03/5-7			orah		comn
Time:         08:00           Compounds         μg/I           Compounds         μg/I           Compounds         μg/I           (a)Pyrene         0.17           nutrophenol         3.5           xo(a)It/Anthracene         0.17           xo(a)Anthracene         0.17           ac Acid         0.17           in Acid         0.17           in Acid         0.17           in Acid         0.17           phthene         0.17           colc         0.17           phthene         0.17           phthene         0.17           phthene         0.17           phthene         0.17           phthene         0.17           phth	108232   108240   1310   1810   1810   18234   108242   108244   108242   108244   108242   108244   108242   108244   108242   108244   108242   108244   108242   108244   10824242   10824242   10824242   10824242   10824242   10824242   10824242   10824242   10824242			03/5		03/5-6
Lab Log#:         1082           Compounds         μg/I           Compounds         μg/I           (a)Pytene         0.17           nitrophenol         3.5           xo(a,ll)Anthracene         0.17           xo(a,ll)Anthracene         0.17           xo(a,ll)Anthracene         0.17           ro-3-Methylphenol         0.17           ic Acid         0.17           ic Acid         0.17           influence         0.17           phthiene         0.17           cone         0.17           phthiene         0.17           cosodiphenylamme         0.17           osodiphenylamme         0.17           osodiphenylamme         0.17           influent sample         1           Effluent sample         1           Effluent sample         1           Ecology sample         1           Ecology sample         1           UT         1	108232   108244   108246   1082444   1082444   1082444   1082444   1082444   108244   10824	8:00	00:8	1810		08:00-08:00
Compounds         µg/I           (a)Pyrene         0.17           nitrophenol         3.5           xo(a,b)Anthracene         0.17           ro-3-Methylphenol         0.17           e         0.17           e Acid         0.17           ic Acid         0.17           hlorocthane         0.17           hlorochane         0.17           phthene         0.17           phthene         0.17           osodiphenylamine         0.17           osodiphenylamine         0.17           ne         0.17           hlorobutadiene         0.17           Influent sample         1           Effluent sample         1           Ecology sample         J           Ecology sample         UJ	μgL         μgL         μgL         μgKs-dry vt.           0.17 U         0.2 UJ         0.15 UJ         3 000         U           0.17 U         0.17 U         0.15 UJ         7510 U         U           0.17 U         0.12 U         0.15 UJ         1500 UJ         U           0.17 U         0.2 U         0.15 U         1500 UJ         U           0.17 U         0.2 U         0.15 U         1500 UJ         U           0.17 U         0.2 U         0.15 U         1500 UJ         REJ           0.17 U         0.2 U         0.15 U         1500 UJ         REJ           0.17 U         0.2 U         0.15 U         1500 UJ         REJ           0.17 U         0.2 U         0.15 U         1500 UJ         U           0.17 U         0.2 U         0.15 U         1500 U         U           0.17 U         0.2 U         0.15 U         1500 U         U           0.17 U         0.15 U         0.15 U         1500 U         U           0.17 U         0.15 U         0.15 U         1500 U         U           0.17 U         0.15 U         0.15 U         1500 U         U           0.17 U         0.1			108244		108249
(a)Pyrene 0.17  Introphenol 3.5  zo(a.1)Anthracene 0.17  e A-3-Methylphenol 0.17  e A-cid 230  hlorochane 0.17  thorocyclopentadiene 0.17  thincocyclopentadiene 0.17  phthene 0.17  cosodiphenylamine 0.17  ne Colic 0.17  hlorobutadiene 0.17  ne 0.17  hlorobutadiene 0.17  Effluent sample 1  Effluent sample 1  Ecology sample 1  Ecology sample 1  Ecology sample 0.17	0.17 U       0.2 UJ       0.15 UJ       30000 U         3.5 UJ       4 UJ       3 UJ       30000 U         0.17 U       0.2 U       0.15 U       1500 UJ         230 J       0.17 U       0.2 U       0.15 U       1500 UJ         1.7 U       0.2 U       0.15 U       1500 UJ         1.7 U       0.2 U       0.15 U       1500 UJ         0.17 U       0.2 U       0.15 U       1500 UJ         0.17 U       0.2 U       0.15 U       1500 U         0.17 U       0.15 U       1500 U       0         0.17 U       0.15 U       1500 U       0         0.17 U       0.15 U       1500 U       0 <tr< td=""><td>μg/L</td><td></td><td>μg/Kg-dry wt.</td><td></td><td>µg/L</td></tr<>	μg/L		μg/Kg-dry wt.		µg/L
introphenol 3.5  Exe(a.h.)Anthracene 0.17  (a)Anthracene 0.17  e. Acid 0.17  is Acid 230  hloroethane 0.17  filorocyclopentadiene 0.17  titlorocyclopentadiene 0.17  one 0.17  Influent sample 1  Effluent sample 1  Exclosy sample 1  Exclosy sample 1	3.5 UJ 4 UJ 3 UJ 30000 U 0.17 U 0.2 U 0.15 UJ 7510 U 0.17 U 0.2 U 0.15 U 1500 UJ 230 J 6 UJ 30000 U 0.17 U 0.2 U 0.15 U 1500 UJ 230 J 6 UJ 30000 U 0.17 U 0.2 U 0.15 U 1500 UJ 2 U 0.15 U 1500 UJ 0.17 U 0.2 U 0.15 U 1500 UJ 0.17 U 0.2 U 0.15 U 1500 UJ 0.17 U 0.2 U 0.15 U 1500 U 0.17 U 10 0.2 U 0.15 U 1500 U 0.17 U 10 0.2 U 0.15 U 1500 U 0.17 U 10 0.2 U 0.15 U 1500 U 0.17 U 10 0.2 U 0.15 U 1500 U 0.17 U 10 0.2 U 0.15 U 1500 U 0.17 U 10 0.2 U 0.15 U 1500 U 0.17 U 10 0.2 U 0.15 U 1500 U 0.17 U 10 0.2 U 0.15 U 1500 U 0.17 U 10 0.2 U 0.15 U 1500 U 0.17 U 10 0.2 U 0.15 U 1500 U 0.17 U 10 0.2 U 0.15 U 1500 U 0.17 U 10 0.2 U 0.15 U 1500 U 0.3 U 0.15 U 1500		919	3000 11		H1 61 U
Action   A	0.17 U 0.2 U 0.15 UJ 5510 U 0.17 U 1500 U 0.17 U 0.2 U 0.15 UJ 5510 U 1500 U 0.17 U 0.17 U 0.12 U 0.15 U 1500 U 1500 U 0.17 U 0.17 U 0.15 U 1500 UJ 15		2	20000 TI		111 05 0
(a) Antitracene 0.17  are 2.3-Methylphenol 0.17  be Acid 2.30  hloroethane 2.30  hloroethane 0.17  filorocyclopentadiene 0.17  one on 0.17  phthene 0.17  osodiphenylamine 0.35  osodiphenylamine 0.35  osodiphenylamine 0.17  ne 0.17  hlorobutadiene 1  Effluent sample 1  Ecology sample 1  Ecology sample 1  Ecology sample 0.17	0.17 U			30000 U		10 OC.2
(a)Anthracene ro-3-Methylphenol  b. Acid  c. Acid  b. Acid  hloroethane  hloroethane  hloroethane  hloroethane  0.17  rone  phthene  0.17  phthene  0.17  osodiphenylamine  0.35  osodiphenylamine  0.17  ose  b. Acid  hlorobutadiene  0.17  ose  cole  b. Acid  cole  1. Acid  ne  0.17  ose  cole  hlorobutadiene  1. Acid  hlorobutadiene  1. B. Effluent sample  1. Cology samp	0.17 U 0.2 U 0.15 U 1500 U 0.17 U 0.2 U 0.15 U 1500 U 0.17 U 0.2 U 0.15 U 1500 U 0.17 U 0.87 J 6 UJ 30000 U 0.17 U 0.2 U 0.15 U 1500 U 0.17 U 0.2 U 0.15 U 1500 U 0.17 U 0.25 U 0.15 U 1500 U 0.17 U 0.25 U 0.15 U 1500 U 0.17 U 0.2 U 0.15 U 1500 U 0.17 U The analyte was positively identified. The associated numerical result is an estimate.    U The analyte was not detected at or above the reported result.   U The analyte was not detected at or above the reported result.		CTO 67:	n arci		f5 ; 67 71.5
e Acid  is Acid  is Acid  is Acid  hloroethane  hloroethane  hloroethane  hloroethane  hloroethane  hloroethane  hloroethane  hloroethane  0.17  phthene  0.17  osodiphenylamine  0.35  osodiphenylamine  0.17  ose  hlorobutadiene  0.17  ose  hlorobutadiene  0.17  bluorobutadiene  hlorobutadiene  hlorobutadiene  Ultuent sample  J Effluent sample  Ultuent sample  Ultuent sample  Ultuent sample  Ultuent sample  Ultuent sample  Ultuent sample	0.17 U 0.2 U 0.15 U 1500 UJ 230 J 0.87 J 6 UJ 30000 U 0.17 U 0.2 U 0.15 U 1500 UJ 1.5 U 1500 UJ 2 U 0.15 U 1500 UJ 2 U 0.15 U 1500 UJ 2 U 0.15 U 1500 UJ 0.17 U 0.25 0.5 553 J 0.17 U 0.4 U 0.021 J 1500 U 0.35 U 0.15 U 1500 U 0.37 U 0.15 U 1500 U 0.37 U 0.15 U 1500 U 0.38 U 0.15 U 1500 U 0.39 U 0.15 U 1500 U 0.17 U 0.2 U 0.15 U 1500 U 0.2 U 0.15 U 1500 U 0.2 U 0.15 U 1500 U 0.3 U 0.15 U 1		U 0.15	1500 U		0.1 U
e Acid 230 hloroethane 230 hloroethane 0.17 tiloroeyclopentadiene 1.7 rone phthene 0.17 phthene 0.17 athrene 0.17 sosodiphenylamine 0.17 ne 0.17 hlorobutadiene 0.17 hlorobutadiene 0.17 Effluent sample 1 Effluent sample 1 Ecology sample 1	0.17 U 0.2 U 0.15 U 1500 UJ 230 J 0.87 J 6 UJ 30000 U 0.17 U 0.2 U 0.15 U 1500 UJ 1.7 U 0.25 U 0.15 U 1500 UJ 1.7 U 0.25 U 0.15 U 1500 U 0.17 U 0.25 U 0.15 U 1500 U 0.18 U 1500 U 0.19 U 0.19 U 1500 U 0.10 U 0.10 U 1500 U 0.10 U 0.10 U 1500 U 0.11 U 0.12 U 0.15 U 1500 U 0.12 U 0.15 U 1500 U 0.13 U 0.15 U 1500 U 0.14 U 0.15 U 1500 U 0.15 U 1500 U 0.17 U 0.2 U 0.15 U 1500 U 0.17 U 1500 U 0.17 U 0.15 U 1500 U 0.17 U 1500 U 0.17 U 1500 U 0.18 U 1500 U 0.19 U 1500 U 0.1		U 0.15	3000 U		0.1.0
Acid   230	230 J		U 0.15	1500 UJ		0.12 U
hloroethane 0.17 filorocyclopentadiene 1.7 rone puthene 0.17 puthrene 0.17 anthrene 0.35 asodiphenylamine 0.17 ne 0.17 ne 0.17 hlorobutadiene 0.17 linfluent sample 1 Effluent sample 1 Ecology sample UJ	0.17 U 0.2 U 0.15 U 1500 UJ  1.7 U 0.25 U 1.5 U REJ  0.17 U 0.25 0.5 553 J  0.17 U 0.2 U 0.15 U 1500 U  0.20 U 0.15 U 1500 U  0.35 U 0.4 U 0.021 J 1500 U  0.35 U 0.2 U 0.15 U 1500 U  0.17 U 0.0 U 0.15 U 1500 U  0.17 U 1500 U 1500 U  0.17 U 1500 U  0.18 U 1500 U  0.19 U 1500 U  0.19 U 1500 U  0.10 U 1500 U  0.10 U 1500 U  0.11 Uhe analyte was positively identified. The associated numerical result is an estimate. grab  U The analyte was not detected at or above the reported result.  U The analyte was not detected at or above the reported result.  Company sample REJ The datum is unsuitable for all purposes.		9	3000c U		122,00 1
hibotocyclopentatione 1.7  rone	1.7   U		U 0.15	1500 UJ		0.12 U
rone         0.17           phthene         0.17           rithrene         0.35           osodiphenylamine         0.17           sole         0.17           hlorobutadiene         0.17           influent sample         1           Effluent sample         1           Ecology sample         U	0.17 U         0.25         0.5         553 J           0.17 U         0.15 U         0.15 U         1500 U           0.35 U         0.4 U         0.021 J         1500 U           0.17 U         0.2 U         0.15 U         1500 U           1         The analyte was positively identified. The associated numerical result is an estimate.         grab           J         The analyte was not detected at or above the reported estimated result.         Tmsf-Blk           U         The analyte was not detected at or above the reported result.         Tmsf-Blk           V         The datum is unsuitable for all purposes.         Tmsf-Blk		ST 12	REJ		1,20 U
hithene 0.17  athrene 0.35  osodiphenylamine 0.35  osodiphenylamine 0.17  ole 0.17  hlorobutadiene 0.17  Effluent sample 1  Effluent sample 1  Ecology sample UJ	0.17 U         0.15 U         0.15 U         1500 U           0.25 U         0.4 U         0.021 J         1500 U           0.17 U         0.2 U         0.15 U         1500 U           1         The reported result is an estimate because of the presence of interference.         comp           J         The analyte was positively identified. The associated numerical result is an estimate.         grab           UJ         The analyte was not detected at or above the reported estimated result.         Tmsf-Blk           U         The analyte was not detected at or above the reported result.         Tmsf-Blk           V         The datum is unsuitable for all purposes.         Tmsf-Blk			553 J		0.12 U
inthrene 0.35  osodiphenylamine 0.17  ne 0.17  sole 0.17  hlorobutadiene 0.17  Effluent sample 1  Effluent sample 1  Ecology sample UJ	0.35 U         0.4 U         0.021 J         1500 U           0.17 U         0.2 U         0.15 U         1500 U           0.17 U         0.2 U         0.15 U         1500 U           0.17 U         0.2 U         0.15 U         1500 U           0.17 U         0.15 U         0.15 U         1500 U           1         The reported result is an estimate because of the presence of interference.         comp           J         The analyte was positively identified. The associated numerical result is an estimate.         grab           UJ         The analyte was not detected at or above the reported estimated result.         Trinsf-Blk           U         The analyte was not detected at or above the reported result.         Trinsf-Blk           V         The datum is unsuitable for all purposes.         This figure is the contract of the		0.15	1500 U		0.12 U
osediphenylamine         0.17           ne         0.17           sole         0.17           hlorobutadiene         0.17           Influent sample         1           Effluent sample         J           Ecology sample         UJ	0.17 U         0.2 U         0.15 U         1500 U           0.17 U         0.2 U         0.15 U         1500 U           0.17 U         0.2 U         0.15 U         1500 U           0.17 U         0.15 U         1500 U           1         The reported result is an estimate because of the presence of interference.         comp           J         The analyte was positively identified. The associated numerical result is an estimate.         grab           UJ         The analyte was not detected at or above the reported estimated result.         Trnsf-Blk           U         The analyte was not detected at or above the reported result.         Trnsf-Blk           W         The datum is unsuitable for all purposes.         The analyte was not detected at or above the reported result.		U = 0.021	1500 U		0.25 U
totle  ### Application  ### Application  ### Application  ### Application  #### Application  #### Application  #### Application  #### Application  #### Application  ##### Application  ###################################	0.17 U         U         0.15 U         0.15 U         1500 U           0.17 U         0.17 U         0.15 U         0.15 U         1500 U           1         The reported result is an estimate because of the presence of interference.         0.15 U         1500 U           1         The analyte was positively identified. The associated numerical result is an estimate.         comp           UJ         The analyte was not detected at or above the reported estimated result.         Trnsf-Blk           U         The analyte was not detected at or above the reported result.         Trnsf-Blk           V         The datum is unsuitable for all purposes.         The datum is unsuitable for all purposes.		U 0.15	3000 U		0.12 U
hlorobutadiene 0.17  Influent sample I Effluent sample J  Ecology sample UJ	0.17 U 0.15 U 0.15 U 1500 U  1 The reported result is an estimate because of the presence of interference.  1 The analyte was positively identified. The associated numerical result is an estimate.  1 The analyte was not detected at or above the reported estimated result.  2 The analyte was not detected at or above the reported result.  3 The analyte was not detected at or above the reported result.  4 The datum is unsuitable for all purposes.	U	U 0.15	1500 U		0.12 U
hiorobutadiene Influent sample Effluent sample Ecology sample UJ	1 The reported result is an estimate because of the presence of interference.  1 The analyte was positively identified. The associated numerical result is an estimate.  2 The analyte was not detected at or above the reported estimated result.  3 The analyte was not detected at or above the reported result.  4 The analyte was not detected at or above the reported result.  5 The datum is unsuitable for all purposes.	Ω	Ω	1500 U		0.12 U
Influent sample I Effluent sample J Ecology sample UJ	I The reported result is an estimate because of the presence of interference. comp  J The analyte was positively identified. The associated numerical result is an estimate. grab  UJ The analyte was not detected at or above the reported estimated result. Trnsf-Blk  U The analyte was not detected at or above the reported result.  Company sample REJ The datum is unsuitable for all purposes.	N	n	1500 U		
Ecology sample J Ecology sample UJ	J The analyte was positively identified. The associated numerical result is an estimate. grab  UJ The analyte was not detected at or above the reported estimated result.  U The analyte was not detected at or above the reported result.  Company sample REJ The datum is unsuitable for all purposes.	The reported result is an estimate because of	the presence of interference.	comp	Composite sample	
Ecology sample UJ	UJ The analyte was not detected at or above the reported estimated result. Trnsf-BIK  U The analyte was not detected at or above the reported result.  Company sample REJ The datum is unsuitable for all purposes.	The analyte was positively identified. The as	sociated numerical result is an		Grab sample	
	U Company sample REJ	The anaylte was not detected at or above the	reported estimated result.		Effluent Transfer blank	
	Company sample REJ	The analyte was not detected at or above the	reported result.			
Onil Coda Tanning Company cample REI	KEJ	The determine in interplace of the second				

TOCHEROII	THAPE	T.	FfF	Tmef.R1	Sludge		ال
E		į.	G-10	id-isiiii	Sinuge	))-I3	ζ,
Type:		du	comp	grab	grab	comp	d d
Date:		03/5-6	03/5-6	03/4	03/5	03/5-6	9
Time:		08:00-08:00	08:00-08:00	1310	1810	08:00	08:00-08:00
Lab Log#:	108	108232	108240	108243	108244	108249	249
BNA Compounds	ริท	hg/L	1/gn	J/gn	μg/Kg-dry wt.	ริท	T/Srl
Pentachlorophenol	<u> </u>	11.4	3.1.5	1131	7410 11	-	3.11
2.4.6. Trichlorophenol	0.17	7 T.1	) ( C	) 14 C	1500 11	4.4. 0.1.0	
2,1,0-1110morophenor			0.7. 7.* *	0.10 C	200 U	71.0	), 1, 10 1,
Z-introaminne	); -: ·	); (-	); + ·	) ; ;	3000 U	A 6.7	<u>۔</u>
2-Nitrophenol		0 /	2 U	1.5 U	7510 U	1.2	2 U
Naphthalene	0.44	<del></del>	0.03 J	0.057 J	173 J	1.2	2
2-Methylnaphthalene	0.24	-	0.02 J	0.077 J	65 J	0.086	6 J
2-Chloronaphthalene	U 11 0	7 U	$0.2\mathrm{U}$	$0.15\mathrm{U}$	1500 U	0.12	$^2$
3.3'-Dichlorobenzidine	1.7	7 U	2.11	151	3000 11	1.2	2.11
Benzidine	F		2 111	111 \$ 1		6.	0.111
2 Motherhonel	710	7	. I C C	) 1: 	1500 11	*** CI O	) } }
2-ivieutytpiteitoi	V.I.O	) (	0.7.0	0.13 C		71.0 ©# 0	) ; , v
1,z-Luchiorobenzene	D 7170	J:	7.7.0 1.7.0	⊃ ; ; ; ;	בייים ביי	71 A	⊃ ; √ ;
2,4,5-Trichlorophenol	0.17	7 U	0.2 U	0.15 U	1500 U	0.12	2 U
Nitrobenzene	0.17 U	7 U	0.2 U	0,15 U		0.12	
3-Nitroaniline	1.5	7 U	2 U	1.5 U	3000 UJ	1.2	2 U
4-Nitroaniline	N 2.1	n 4	2 U	1.5 U	3000 UJ	1.2	
4-Nitrophenol	U.87 U	7 U	1 U	0.75 U	15000 U	0.62	
Benzyl Alcohol	6		0.2.43	0.15.13	3000 11	210	2.11
2 4-Dimethylphenol	0 17 11	7 11	0.7.1	0.15.1	3000 J	0.12	ر 1 د
2,1-Duncalythical	\.I.U	)	0.2.0	0.17 C		21.0	3. t
4-iviculyiphichot			) i c	7	730 J	A1.5	) (
1,4-Dichlorobenzene	4.0.0 **********************************	**	0.7.0	U.I.		0.12	O 7
4-Chloroantine	0.17 U	<b>→</b>	U.Z.U	⊃ ¢I;o	825 J	0.12	⊃
Phenol			0.22	0.15 U	1500 U	0.49	6
Pyridine	0.35 U	5 U	0,4 U	0.3 U	3000 U	0.25	2
Bis(2-Chloroethyl)Ether	0.17 U	n 2	0.2 U	0.15 U	1500 U	0.12	2 U
B1s(2-Chloroethoxy)Methane	0.17 U	7 U	0.2 U	0,15 U	1500 U	0.12	$^2$ U
Di-n-Octyl Phthalate		7 U	2 UJ	1.5 UJ	7510 U	1.2	2 UJ
Hexachlorobenzene	0.17 U	7 U	0.2 U	0.15 U	1500 U	0.12	2 U
Anthracene	0.17	7 U	0.2 U	0.15 U	1500 U	0.12	2 U
1,2,4-Trichlorobenzene	U 11 0	7 U	0,2 U	0.15 U	1500 U	0.12	2 U
2,4-Dichlorophenol	0.17	7 U	0.2 U	0.15 U	3000 U	0.12	2 U
2,4-Dinitrotoluene	3,5 U	5.U	4 U	3 D	7510 U	23	2 0
1,2-Diphenylhydrazine	0.17	7 U	0.2 U	0.15 U	1500 U	0.12	0.12 U
Pyrene	U 117 U	7 D	0,2 U	0.15 U	286 J	0.12	2 U
Dibenzofuran	0.17	7 U	0.2 U	0.15 U	1500 U	0.12	2 U
Indeno(1,2,3-ed)Pyrene	011	7 U	0.2 UJ	0.15 UJ	7510 U	0.12	2 UJ
Benzo(b)Fluoranthene	0.17	7 U	0.2 UJ	0.15 UJ	1500 U	0.12	2 UJ
Ef Effluent sample	sample	The analyte was positively identified.	The associated numerical result is an estimate	rical result is an	estimate. comp	Composite sample	
Influent sample	Sample	The anaylte was not detected at or above the reported estimated result.	ove the reported estin	nated result.	grah	Grab sample	
		The analyse was not detected at or above the analyse of I	luser betrough ethe evo		b		
		The analyte was not detected at or an					

Location:	H-11	Ff-F	Tmsf-Bl	Sindoe	Ef-OC.
Tyne	amo)	T IT	mah Zi	orsh	25-77 Compa
Dotor	93/50	4mo	81a0	(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	7 5) EO
Date:	03/3-0	03/3-0	1310	03/3	03/3-0
I ab I out:	U8:00-08:00 108233	108340	1510	108244	08:00-08:00
	70001	0+7001	CF-7001	1007	100247
BNA Compounds	T/Sn	$_{ m Lgh}$	$^{ m Lgn}$	μg/Kg-dry wt.	ηg/L
Fluoranthene	0.17 U	0,2 U	0.013.3	322 J	0.12 U
Benzo(k)Fluoranthene	0.17 U	0.2 UJ	0.15 UJ	1500 U	0.12 UJ
Acenaphthylene	0 17 U	0.2 U		1500 U	0.12 U
Chrysene	0.17~ m U	0.2 U	0.15 U	1500 U	0.12 U
4,6-Dinitro-2-Methylphenol	1.7 U	2 U	1.5 U	15000 U	1.2 U
1,3-Dichlorobenzene	0.17 U	0.2 U	0.15 U	1500 UJ	0.12 U
2,6-Dinitrotoluene	3.5 U	<b>0</b> #	3 f)	7510 U	2.5 U
N-Nitroso-di-n-Propylamine	0.17 U	0.2 U	0.15 U	1500 U	0.12 U
1-Methylnaphthalene	0.19	0,2 U	0.045 J	1500 U	0.073 J
2-Chlorophenol	$0.17~\mathrm{U}$	0.2 U	0.15 U	1500 U	0.12 U
Bis(2-Chloroisopropyl)Ether	0.17 U	0.2 U	0.15 U	1500 U	
Retene	0.17 U		0.15 U	3000 U	$0.12~\mathrm{U}$
3B-Coprostanol	300 J	84 J	3.03	97500	95000
Caffeine	41 [	$0.2~\mathrm{U}$	0.15 U	3000 U	0.12.17
N-Nitrosodimethylamine	A 28.0	10	0.75 U	7510 U	0.62 Ū
Benzothiazole					ZZ
Ethanol, 2-(2-Butoxyethoxy)-, Acetate	ate 147 NJ		IN 61		
Cyclohexasiloxane, Dodecamethyl-			0.96 NJ		
Cholesterol		IN 8:9		13900 NJ	IN 61
Location	Inf-F.	Ff.F	Tmsf-B1	Sludoe	FfOC
Tyne	i mi	7.77	orah	grah	27.77 mmo
Date:	7,75-6 03/5-6	4m2 9-5/E0	grab 03/4	grac 03/5	03/5-6
Time:	00:80-00:80	00:80-00:80	1310	1810	00.80-00.80
Lab Log#:	108232	108240	108243	108244	108249
Pesticide/PCB Compounds	T/в́п	T/gn	µg/L	μg/Kg-dry wt.	η/gπ
lalpha-BHC	(1) 1600 O	11 100	0.0034 []	30 []	0.0062 111
beta-BHC	0.0091 UJ	0.01 U		30 U	
delta-BHC	0.0091 UJ	0.01 U	0.0034 U	30 U	0.0062 UJ
gamma-BHC (Lindane)				30 U	
Heptachlor			0.0034 U	30 U	
Aldrin	9			30 U	
Heptachlor Epoxide		O 1070	0,0034	30 D	
Endosulfan I	3	0.01 U	- 8		8
Lielann 14 4' DDE	0.0001 U.I	U-01 U-0	0,0034 U	30 U	fi 79600
	U.U031 U.U.	- [	0.0034		
	Quil Ceda Tanning Company sample.	-	resent. The assoc	result is an estimate	Sludge Fond sludge sample
Ini minent sample	Composite sample		ove the reported	stimated result.	
	- (	- · · · · · · · · · · · · · · · · · · ·		•	

Particular Contonia   Eff.   Fire Sign   Shappe   Eff.   Contonia   Eff.   Contonia   Eff.    Location: Type: Date: Time: Time: Time: Lab Log#:  Ifan II D Ifan Sulfate T Your Sctone Addehyde Addehyde Addehyde Time: Type: Date: Time: Lab Log#: If II	Inf-E comp 03/5-6 08:00-08:00	Ef-E	Trnsf-Bl	Sludge	OFFICE AND PROPERTY OF THE PRO	FFOC	
Type:	Type: Date: Time: Time: Lab Log#: Ie/PCB Compounds Ifan II D D Ifan II I	comp 03/5-6 08:00-08:00	amoo	•			ンンゴ
Time	Date: Time: Lab Log#: Ie/PCB Compounds Ifan II D Ifan Sulfate T Sychlor Ketone ene Aldehyde Type: Date: Time: Time: Lab Log#: Im	03/5-6	comp	grab	grab		comp
True:   DESTRUCTOR Community   100.00	Time:  Lab Log#:  Ie/PCB Compounds  Ifan II D D Ifan Sulfate T Yoeltor Kefone ene Attefive Ene Attefive T Type: Date: Type: Date: Time: Time: Lab Log#:  m m um um um	08:00-08:00	03/5-6	03/4	03/5		03/5-6
Lab Logfs   1082.12   1082.14   10	Lab Log#:  le/PCB Compounds  Ifan II  D  Ifan II  D  Ifan Sulfate  T  ychlor  Ketone and  T  Location: Type: Date: Type: Date: Type: Date: Time: Lab Log#:  m  m  m  un  un  un  un  In  In  In  In  In  In	)	08:00-08:00	1310	1810		08:00-08:00
Interference   Inte	Ie/PCB Compounds  Ifan II D Ifan Sulfate T ychlor Ketone ene Addehyde Type: Date: Type: Date: Time: Time: Type: On the compound of the compoun	108232	108240	108243	108244		108249
The control of the	fan II D Ifan Sulfate T Sychlor Ketome ene Aldefryde Type: Date: Time: Time: Lab Log#:	T/ $8$ n	µg/L	µg/L	μg/Kg-dry wt.		µg/L
Julian II	Ifan II D Ifan Sulfate T Yechor Kefone ene Addelivde Addelivde Type: Date: Type: Date: Time: Lab Log#:  m m m um	0.0091 UJ	Ω	(,0034 U	30 U		0.0062 UJ
10	D Ifan Sulfate  T schor  Ketome Aidehyde  Aidehyde  Location: Type: Date: Time: Lab Log#:  m  m  um  um		n	8	30 U		0.0062 UJ
Marche   0.0099   UJ   0.01   U   0.0044   U   30   U   0.0044   U   U   U   U   U   U   U   U   U	Ifan Sulfate T ychlor Ketome Aldehyde Aldehyde Type: Date: Time: T		Ω		30 U		3333
Compared by Comp	ychlor Ketone ene Aldehyde Type: Date: Time: Time: Lab Log#:		Ŋ	).0034 U	30 U		3
Action   A	ychlor Ketone ene Aldehyde  Location:		n	1,0034 U	30 U		
Late   Location:   Colony   Uff   Colony   Col	Addehyde Addehyde  Location: Type: Date: Time: Time: Lab Log#:	- 8	D.	).0034 U	30 U		- 30
Location:   Inf-E	Aldehyde  Location:     Type:     Date:     Time:     Tab Log#:  m um	383	⊃ ⊏	7.0034 C	30 U		0.0062 UJ 0.18 TII
Location:   Inf-E	Lab in		o D	1,0034 U	30 Ú		0.0062 UJ
Type: Comp   Gomp   grab   g	Lab in in in in	Inf-E	Ef-E	Tmsf-Bl	Sludge		Ef-QC
Date:   Date:   Conference   Date:   D	Lab m m um	comn	comp	orsh	orah		Comp
Time:         08:00-08:00         08:00-08:00         1310         1810           Lab Log#:         108232         108240         1362         108244           ony         Hg/L         Hg/L         Hg/L         mg/kg-dry wr.           ony         30 U         30 U         3 U         3 U           cum         0.39         0.2         0.2         0.35           um         0.39         0.2         0.2         0.34           diam         0.39         0.2         0.2         3.41           r         46         10         5 U         2.4           r         46         10         5 U         2.4           r         46         10         5 U         2.4           r         46         1.5 U         1.5 U         1.5 U           r         1.5 U         1.5 U         1.5 U         1.5 U           m         1.5 U         1.5 U         1.5 U         1.5 U           m         1.5 U         1.5 U         1.5 U         4 U           r         1.5 U         1.5 U         4 U         4 U           r         1.5 U         1.5 U         1.5 U         0.5 U <td>Lab m m unn</td> <td>03/5-6</td> <td>03/5-6</td> <td>5745 03/4</td> <td>5/n2 03/5</td> <td></td> <td>03/5-6</td>	Lab m m unn	03/5-6	03/5-6	5745 03/4	5/n2 03/5		03/5-6
Lab Log#: 108232   108240   1082444   108244   10824444   108244444   108244444   108244444   108244444   108244444   108244444   108244444   108244444   108244444   108244444   1082444444   10824444444   1082444444444444444444444444444444444444	Lab ny m un	00:00-00:00	08:00-08:00	1310	1810		08:00-08:00
±g/L         μg/L         μg/L         μg/L         mg/Kg-dry wt.           out         30 U         30 U         30 U         31 U           c         1.5 UJ         1.5 UJ         1.5 UJ         1.19           cum         0.39         2 U         2 U         3.41           dm         0.39         0.2         0.2 U         3.41           r         46         10         5 U         25.4           r         6.7 J         1.9 J         1.39         8           r         6.7 J         1.9 J         1.53         8           r         1.5 U         1.5 U         1.57         9           r         1.5 U         1.5 U         1.5 U         1.5 U           r         1.5 UJ         1.5 UJ         1.5 U         1.5 U           r         1.5 UJ         1.5 UJ         1.5 UJ         4 UJ           r         1.5 UJ         1.5 UJ         1.5 UJ         4 UJ           r         1.5 UJ         1.5 UJ         1.5 UJ         1.5 UJ           r         1.5 UJ         1.5 UJ         1.5 UJ         4 UJ           r         1.5 UJ         1.5 UJ         1.5 UJ	Metals Antimony Arsenic Beryllium Cadmium Chronium	108232	108240	108243	108244		108249
c         30 U         11.9 UI         11.9 UI         11.9 UI         11.9 UI         11.9 UI         20 U         0.032         20 U         0.032         20 U         0.032         20 U         0.032         20 U         0.03 U         0.04 U         0.04 U         0.04 U         0.04 U         0.04 U         0.05 U         <	Antimony Arsenic Beryllium Cadmium Chronium	μg/L	µg/L	µg/L	mg/Kg-dry wt.		T/Bri
1.5 UJ   1.5 UJ   1.5 UJ   1.19     2 U   2 U   0.32     3 U   0.32     0.39   0.2 U   3.41     1.5 UJ   1.5 UJ   1.34     1.5 UJ   1.5 UJ   1.35     1.5 UJ   1.5 UJ   1.5 UJ     1.5 UJ   1	Arsenic Beryllium Cadmium Chromium	30 U	30 U	30 U	3 UJ		30 U
with the collection of th	Servitum Cadmium Chromium	1.5 UJ	1.5 UJ	1.5 UJ	11.9		1.5 UJ
um         0.39         0.2         0.2         0.2         0.34           r         46         10         5         1         254           r         46         10         5         1         234           ry (Total)         0.13         0.05         0         1.5         3           um         1.5         0.1         1.5         0.1         1.5         3         1         0         53.8           mm         1.5         0.1         1.5         0.1         1.5         0         0.5         0         0.4         0.1           m         72.5         1.5         0.1         1.5         0.4 <td< td=""><td>  Cadmium   Chromium   Common</td><td>٦ , ٦</td><td>⊋ 7 °</td><td>n ; ;</td><td>7.77</td><td></td><td>77</td></td<>	Cadmium   Chromium   Common	٦ , ٦	⊋ 7 °	n ; ;	7.77		77
The stands   The	Common	0.39 9.8	0.2	0.2 U ★ 11	3.41 >=4		0.2 U
1.5   1.9   1.15   1.3   1.3   1.5		46	) 	5 11	224 234		, X
1.5 UJ   0.4 UJ      The analyte was positively identified. The associated numerical result is an estimate.   Composite sample   Ecology sample   U   The analyte was not detected at or above the reported estimated result.   Pond sludge sample   Pond sludge sample   Quil Ceda Tanning Company sample   Quil Ceda Tanning Company sample   Quil Ceda Tanning Company sample   Pond sludge	Lead	6.7 J	f 6'I	101	139		3.01
1.5 UJ   1.5 UJ   1.5 UJ   17.5   17.5   1.5 UJ   4.1	Mercury (Total)	0.13	0.05 U	0.05 U	1.57		0.05 U
1.5 UJ   1.5 UJ   17.5   1.5 UJ   17.5   1.5 UJ   17.5   1.5 UJ    Nickel	3,7	m	<b>D</b> T	53.8		17.7	
I.5 UJ 1.5 UJ 1.5 UJ 1.5 UJ 1.5 UJ 0.4 UJ  72.5 Influent sample J The analyte was positively identified. The associated numerical result is an estimate. comp Composite sample Ecology sample UJ The analyte was not detected at or above the reported estimated result. grab Grab sample Pond sludge sample  Pond sludge sample Quil Ceda Tanning Company sample	Selenium	1.5 UJ	1.5 UJ	1.5 UJ	17.5		1.5 UJ
Influent sample  Influent sample  Influent sample  Ecology sample  Pond sludge sample  Quil Ceda Tanning Company sample	SHYE The line	1.1	0,3 U 1 < 111	1,3 U	±0.0		
Influent sample J The analyte was positively identified. The associated numerical result is an estimate. comp effluent sample UJ The analyte was not detected at or above the reported estimated result.  Pond sludge sample Quil Ceda Tanning Company sample	Thailtin Zing	72.5	1.5 UJ	LO C.1	0.4 465		1.3 OJ 30
effluent sample UJ The analyte was not detected at or above the reported result. grab Ecology sample U The analyte was not detected at or above the reported result. Pond sludge sample Quil Ceda Tanning Company sample	Influent sample		I. The associated numer	rical result is an es		Composite sample	
Ecology sample Pond sludge sample Quil Ceda Tanning Company sample	effluent sample		oove the reported estim	ated result.	grab	Grab sample	
	Ecology sample		oove the reported result	ئىد			

Appendix F - Tentatively Identified Compounds - Marysville Class II, 1996

Inf-E-1			
grab			
03/5			
0930			
108230			
Volatile Organic Analysis (VOA)			
Parameter	Value/	Qualific	er/Units
Formic acid, butyl ester	0.6	NJ	$\mathrm{ug/L}$
Hexanal	0.41	NJ	ug/L
Cyclotestrasiloxane	0.32	NJ	ug/L
7-Oxabicyclo[2.2.1]Heptane, 1-methyl-4-(1-Methylethyl)	0.71	NJ	ug/L
Cincole	2.5	NJ	ug/L

Inf-E-2 grab 03/5				
1650				
108231				
Volatile Organic Analysis (VOA)				
Parameter	Value	/Qualifi	er/Units	
Benzene 1-Ethyl-2-Methyl-	17	NJ	ug/L	
Benzene 1-Ethyl-3-Methyl-	6.8	NJ	ug/L	
Benzene 1,2,3-Trimethyl-	8	NJ	ug/L	

Ef-E-1 grab 03/5 1200 108238	
Volatile Organic Analysis (VOA)	
Parameter	Value/Qualifier/Units
Cyclopentane, 1,1,3,3-tetramethyl-	3.3 NJ ug/L

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

## Appendix F (cont.) - Tentatively Identified Compounds - Marysville Class II, 1996

Ef-E-2	
grab	
03/5	
1810 108239	
100237	
Volatile Organic Analysis (VOA)	
Parameter	Value/Qualifier/Units
Cyclohexane, (ethoxymethoxy)-	3.3 NJ ug/L

EF-QC-1				
grab				
03/5				
1620				
108247				
Volatile Organic Analysis (VOA) Parameter	Value/	'Qualifi	ïer/Units	
Cyclotrisiloxane, Hexamethyl	13	NJ	ug/L	
2-Pentene, 3,4-dimethyl, (	17	NJ	ug/L	
Cyclotetrasiloxane, Octamethyl-	7.7	NJ	ug/L	

EF-QC-2 grab 03/5 1345 108248				
Volatile Organic Analysis (VOA)				
Parameter	Value/	Qualific	er/Units	
Cyclotrisiloxane, Hexamethyl	13	NJ	ug/L	
3Penten-2One, 4-methyl-	15	NJ	ug/L	
Cyclotetrasiloxane, Octamethyl-	6.4	NJ	ug/L	

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

		***************************************	
Sludge			
grab-comp			
03/5			
1810			
108244			
Volatile Organic Analysis (VOA)			
Parameter	Value/	Qualifi	er/Units
Unknown Hydrocarbon 01	117	NJ	ug/L
Unknown Hydrocarbon 02	124	NJ	ug/L
Unknown Hydrocarbon 03	288	NJ	ug/L
Unknown Hydrocarbon 04	119	NJ	ug/L
Unknown Hydrocarbon 05	311	NJ	ug/L
Unknown Hydrocarbon 06	264	NJ	ug/L
Unknown Hydrocarbon 07	271	NJ	ug/L
Unknown Hydrocarbon 08	343	NJ	ug/L
2-Hexene, 5,5-Dimethyl-, (Z)-	118	NJ	ug/L
2-Hexene	674	NJ	ug/L
Bicyclo[2,2,2]octan-1-ol	276	NJ	ug/L
Cyclotrisiloxane, 2,3-Dimethyl-	91	NJ	ug/L
Pentane, 2,2,3-Trimethyl-	270	NJ	ug/L
Nonane, 3-Methyl-5 Propyl	1520	NJ	ug/L
Heptane, 2,2-Dimethyl	1850	NJ	ug/L

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

Inf-E			
comp			
03/5-6			
0800-0800			
108232			
BNA/Pesticides			
Parameter	Value/C	Qualific	er/Units
Unknown 01	12	ŊJ	ug/L
Unknown 02	1.6	NJ	ug/L
Unknown 03	38	NJ	ug/L
Unknown 04	25	NJ	ug/L
Unknown 05	118	NJ	ug/L
Unknown 06	56	NJ	ug/L
Unknown 07	27	NJ	ug/L
Unknown 08	22	NJ	ug/L
Unknown 09	18	NJ	ug/L
Unknown 11	84	NJ	ug/L
Unknown 12	52	NJ	ug/L
Unknown Hydrocarbon 01	2.2	NJ	ug/L
Unknown Hydrocarbon 02	21	NJ	ug/L
2-propanol. 1-(2-Methoxy-Methylethoxy)-	6.1	NJ	ug/L
Ethanol, 2-(2-Butoxyethoxy)-, Acetate	147	NJ	ug/L
Cyclopropane, Nonyl-	34	NJ	ug/L
Decanoic Acid, Tetra-	152	NJ	ug/L
Hexadecanoic Acid	1150	NJ	ug/L
Oleic Acid	4740	NJ	ug/L
Cholest-3-ene, (5.alpha.)-	72	NJ	ug/L
Cholest-5-en-3-ol (3.beta.)	79	NJ	ug/L
Ethanol, 2-Butoxy-	19	NJ	ug/L

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

Ef-E				
comp				
03/5-6				
0800-0800				
108240				
BNA/Pesticides				
Parameter	Value/	Qualifi	er/Units	
Unknown 01	7.4	NJ	ug/L	
Unknown 02	7.3	NJ	ug/L	
Unknown 03	3.6	NJ	ug/L	
Unknown 04	2.7	NJ	ug/L	
Unknown 05	3.8	NJ	ug/L	
Unknown 06	2	NJ	ug/L	
Unknown 07	4.2	NJ	ug/L	
Unknown 08	7.3	NJ	ug/L	
Unknown 09	4.4	NJ	ug/L	
Unknown 10	1.9	NJ	ug/L	
Unknown 11	4.3	NJ	ug/L	
Unknown 12	3	NJ	ug/L	
Unknown 13	2.2	NJ	ug/L	
Unknown 14	1.9	NJ	ug/L	
Unknown 15	5.6	NJ	ug/L	
Unknown 16	4.4	NJ	ug/L	
Cholesterol	6.8	NJ	ug/L	
2-Propanol, 1-(2-Methoxy-1-Methylethoxy)-	2.9	NJ	ug/L	
Phosphoric Acid Tributyl Ester	4	NJ	ug/L	
Phenol, Nonyl-	3.3	NJ	ug/L	

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

True Lille			
Trnf-blk			
grab			
03/4			
1310			
108243			
BNA/Pesticides			
Parameter	Value/C	Qualifi	er/Units
Unknown 01	5.7	NJ	ug/L
Unknown 02	6.8	NJ	ug/L
Unknown 03	6.6	NJ	ug/L
Unknown 04	5.5	NJ	ug/L
Unknown 05	5.2	NJ	ug/L
Unknown 06	2.5	NJ	ug/L
Unknown 07	8.9	NJ	ug/L
Unknown 08	9.4	NJ	ug/L
Unknown 09	10	NJ	ug/L
Unknown 10	9.1	NJ	ug/L
Unknown 11	12	NJ	ug/L
Unknown 12	8.6	NJ	ug/L
Unknown 13	5.4	NJ	ug/L
Unknown 14	4	NJ	ug/L
Unknown 15	2.6	NJ	ug/L
4-Hydroxy-4-Methylpentan-2-one	9	NJ	ug/L
Ethanol, 2-(2-Butoxyethoxy)-	3.3	NJ	ug/L
Cyclohexasiloxane, Dodecamethyl-	0,96	NJ	ug/L
Ethanol, 2-(2Butoxyethoxy)-, Acetate	19	NJ	ug/L
Phosphoric Acid Tributyl Ester	43	NJ	ug/L

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

EF-QC			
grab			
03/4			
1345			
108249			
BNA/Pesticides			
Parameter	Value/	Qualifi	er/Units
Unknown 01	28	NJ	ug/L
Unknown 02	7.4	NJ	ug/L
Unknown 03	4.7	NJ	ug/L
Unknown 04	7.2	NJ	ug/L
Unknown 05	11	NJ	ug/L
Unknown 06	133	NJ	ug/L
Unknown 07	70	NJ	ug/L
Unknown 08	220	NJ	ug/L
Unknown 09	919	NJ	ug/L
Unknown 10	11	NJ	ug/L
Unknown 11	15	NJ	ug/L
Unknown 12	40	NJ	ug/L
Phenol, 4-(2,2,3,3-Tetramethylbutyl)-	17	NJ	ug/L
Disulfide, Dimethyl	13	NJ	ug/L
3-Penten-2-One, 4-Methyl-	17	NJ	ug/L
4-Hydroxy-4-methylpentan-2-one	26	NJ	ug/L
2-methyl-2, 4-Pentanediol	27	NJ	ug/L
Pentanoic Acid, 4-Methyl-	101	NJ	ug/L
Cyclopentanol, 1,2-dimethyl-3-(1-methyle	9.7	NJ	ug/L
Camphor (Acn)	14	NJ	ug/L
Alpha-Terpeneol	47	NJ	ug/L
Benzothiazole	7	NJ	ug/L ug/L
Benzenepropanoic Acid	99	NJ	ug/L ug/L
Benzothiazole, 2(Methylthio)-	33	NJ	ug/L ug/L
Ethanol, 2-[2-[4-(1,1,3,3-Te	133	NJ	ug/L ug/L
Cholesterol	19	NJ	ug/L ug/L

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

## Appendix F (cont.) - Tentatively Identified Compounds - Marysville Class II, 1996

Sludge		
grab-comp		
03/5		
1810		
108244		
BNA/Pesticides		
Parameter	Value/Qualifier/Units	
Unknown 01	17600 NJ ug/L	
Unknown 02	21400 NJ ug/L	
Unknown 03	14300 NJ ug/L	
Unknown 04	21100 NJ ug/L	
Unknown 05	24200 NJ ug/L	
Unknown 06	14600 NJ ug/L	
Unknown 07	20500 NJ ug/L	
Unknown 08	33100 NJ ug/L	
Unknown 09	59800 NJ ug/L	
Unknown Hydrocarbon 01	10900 NJ ug/L	
M-Xylene	13600 NJ ug/L	
Naphthalene, 1,2-Dihydro-1,1,6-Trimethyl-	5520 NJ ug/L	
Naphthalene, 1,3-Dimethyl	2980 NJ ug/L	
2-Nonylphenol	23000 NJ ug/L	
Phenol, Nonyl	47900 NJ ug/L	
Phenol, 4-(2,2,3,3-Tetramethylbutyl)-	26700 NJ ug/L	
Phytol	77400 NJ ug/L	
3,7,11-Tridecatrienenitrile, 4,8,12-Trimethyl-	21700 NJ ug/L	
Cholestan-3-ol, acetate, (3.beta.,5.alph	5160 NJ ug/L	
Vitamin E	14100 NJ ug/L	
Cholesterol	13900 NJ ug/L	
Cholestane, 14-methyl-, (5.alpha.)-	33000 NJ ug/L	
Epicholestanol	56400 NJ ug/L	
(24R,25R)-5,6-Dihydro-5.alphaaplystero	28900 NJ ug/L	
Chondrillasterol	50500 NJ ug/L	

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

# **Appendix G - GLOSSARY - Marysville Class II Inspection**, 1994

BOD<sub>5</sub> Five Day Biological Oxygen Demand

CBOD<sub>5</sub> Carbonaceous Five Day Biological Oxygen Demand

CaCO<sub>3</sub> Calcium Carbonate

CLP Contract Laboratory Program
CVAA Cold Vapor Atomic Absorption

D.O. Dissolved Oxygen

EPA Environmental Protection Agency
k Maximum Rate of Substrate Utilization

k<sub>1</sub> 1st order reaction Rate Coefficient (derived for Total BOD<sub>5</sub> with settling)

Ks Half-Velocity constant kg kilogram (1 X 10<sup>3</sup> grams) L Liter (1 X 10<sup>3</sup> milliliters)

lbs/day Pounds per Day
LOD Limit of Detection

m<sup>3</sup> Cubic meter (1 X 10<sup>3</sup> liters)

MF Membrane Filter

mg milligram (1 X 10<sup>-3</sup> grams)
MGD Million Gallons per Day
mL Milliliter (1 X 10<sup>-3</sup> liters)
MPN Most Probable Number

NH<sub>3</sub> AmmoniaNPDES National Pollutant Discharge Elimination System

PCB Polychlorinated Biphenyls

pH Log<sub>10</sub> of Negative Hydrogen Ion Concentration

PO<sub>4</sub> Phosphate

PP Priority Pollutant

ppm Parts per million (1 X 10<sup>-6</sup> kg/L, 1 mg/L, or 1 mg/kg) ppt Parts per thousand (1 X 10<sup>-3</sup> kg/L, 1 g/L, or 1 g/kg)

QA/QC Quality Assurance/Quality Control

RPD Relative Percent Difference

TIC Total Inorganic Carbon or Tentatively Identified Compound

TKN Total Kjeldahl Nitrogen
TMDL Total Maximum Daily Load
TNVS Total Non-Volatile Solids

TNVSS Total Non-Volatile Suspended Solids

TOC Total Organic Carbon
TP Total Phosphorous

TS Total Solids

TSS Total Suspended Solids
TVS Total Volatile Solids

ug Microgram (1 X 10<sup>-6</sup> grams)

ug/L	Micrograms per Liter
VOA	Volatile Organic Analysis
VSS	Volatile Suspended Solids
WWTP	Wastewater Treatment Plant
X	Volatile Suspended Solids