FACT SHEET FOR NPDES PERMIT
NO. WA-005240-0

COLUMBIA COLSTOR
WENATCHEE MAIN PLANT

SUMMARY

Columbia Colstor Wenatchee Main Plant is a cold storage facility that has been in operation for over 100 years. The site has had numerous owner/operators over the years. Processing of vegetables and presumably fruit once occurred on the site. Any processing activity at the site has long since been suspended. Today, Columbia Colstor owns and operates the facility strictly as a refrigerated warehouse.

The discharge of the facility consists of additive-free non-contact cooling water with an estimated flow of 1.87 million gallons a day, (MGD). A second additive free discharge of 0.072 MGD occurs seven days a week during the summer. This consists of defrost water that flows to the City of Wenatchee's storm sewer system. In winter the 0.072 MGD flow of defrost water to the storm sewer system is reduced to three days a week.

Analysis to determine the dilution factor and effluent effect via the Department's Rivplum5 mixing zone model and a simple mass balance equation demonstrates the effect of temperature and pH upon the large volume of receiving water, the Columbia River, to be miniscule.

Monitoring of the 1.87 MGD flow of non-contact cooling water is required for temperature and pH during the course of the permit period. Monitoring of the defrost 0.072 MGD flow for pH is also required. Water Quality Based Limits for pH are imposed for both the non-contact flow and the lesser defrost flow this permit period. No limit for temperature will be imposed at this time.

TABLE OF CONTENTS

Page

SUMMARY 1

INTRODUCTION 4

GENERAL INFORMATION 5

BACKGROUND INFORMATION 5

DESCRIPTION OF THE FACILITY 5
History 5
Industrial Process 6
Discharge Outfalls 6

PERMIT STATUS 6

SEPA COMPLIANCE 6

WASTEWATER CHARACTERIZATION 6

PERMIT LIMITATIONS 7

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS 8
Numerical Criteria for the Protection of Aquatic Life 8
Numerical Criteria for the Protection of Human Health 8
Narrative Criteria 8
Antidegradation 8
Critical Conditions 9
AKART for Mixing Zones 9

DESCRIPTION OF THE RECEIVING WATER 10

SURFACE WATER QUALITY CRITERIA 10

CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA 10

DILUTION FACTORS 11

WHOLE EFFLUENT TOXICITY 12

Human Health 13
Sediment Quality 13

GROUND WATER QUALITY LIMITATIONS 13

MONITORING REQUIREMENTS 14

LAB ACCREDITATION 14

OTHER PERMIT CONDITIONS 14

REPORTING AND RECORDKEEPING 14

SPILL PLAN 15

OUTFALL 001 EVALUATION 15

GENERAL CONDITIONS 15

PERMIT ISSUANCE PROCEDURES 15

PERMIT MODIFICATIONS 15

RECOMMENDATION FOR PERMIT ISSUANCE 16

REFERENCES FOR TEXT AND APPENDICES 17

APPENDIX A -- PUBLIC INVOLVEMENT INFORMATION 18

APPENDIX B -- GLOSSARY 19

APPENDIX C -- TECHNICAL CALCULATIONS 22

APPENDIX D -- RESPONSE TO COMMENTS 26

INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), which is administered by the Environmental Protection Agency (EPA). The EPA has authorized the State of Washington to administer the NPDES permit program. Chapter 90.48 RCW defines the Department of Ecology's authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the State include procedures for issuing permits (Chapter 173-220 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the State is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least thirty days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see Appendix A--Public Involvement of the fact sheet for more detail on the Public Notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix D--Response to Comments.

GENERAL INFORMATION	
Applicant	Columbia Colstor
Facility Name and Address	Wenatchee Main Plant 410 N. Worthen Wenatchee, WA 98801
Type of Facility:	Refrigerated Warehouse
SIC Code	4222
Discharge Location	Waterbody name: Columbia River <u>Non-contact cooling water</u> <u>#1</u> Latitude: 47° 25' 46" N Longitude: 120° 18' 33" W <u>Condenser Water</u> <u>#2</u> Latitude: 47° 27' 50.6" N Longitude: 120° 18' 37.3" W
Water Body ID Number	WA-CR-1040

BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

History

The refrigerated warehouse and processing facility was constructed prior to the turn of the 20th century. In fact, some of the condensers used in the plant today are the original ones dating back to 1896. In 1975 the owner, Cedergreen Foods Corporation, constructed a wastewater treatment plant and placed it into operation. In 1981 Dalgety Foods purchased the facility and, in response to violations of the permitted effluent limits, made improvements at the treatment plant. Simplot Foods acquired the facility in 1984. Simplot Foods continued to make improvements to the wastewater system. In approximately 1993, the current owner Columbia Colstor transferred the wastewater treatment portion of the facility to the City of Wenatchee and suspended all processing operation at the Wenatchee Main Plant.

Industrial Process

There are no industrial processes undertaken at the plant. The facility is strictly used for storage of preprocessed frozen foods, primarily potatoes. The discharge, therefore, consists of additive free, non-contact cooling water.

Discharge Outfalls

There are two separate discharge outfall locations. One outfall, (# 001), discharges approximately 1.87 MGD of coolant water. Water pumped from the Columbia River is passed over eight cooling towers and captured in the water collection tray. The tray water is then cycled to water jacketed compressors and returned to the water collection tray. This water, less that diverted for evaporator defrost, is piped underground for approximately 1,000 ft to a 12 inch diffuser, which is located down stream of the facility. The diffuser is located approximately 40 ft off the west bank and 32 ft out from low water level in the Columbia River.

The second outfall, (002), consists of coolant water, which has been diverted from the cooling water collection tray. The diverted flow is used to defrost eight evaporative heat exchanges. Diverted tray water is pumped at approximately 200 gallons a minute during defrost. In summer eight evaporative heat exchanges are defrosted daily in succession for 45 minutes. This equates to a summer flow of 0.072 MGD that is discharged directly to the City of Wenatchee's 24 inch storm water system. In summer this process actually chills the water because of the melting ice. In winter, the defrost cycle and the corresponding flow is reduced to 3 times a week.

PERMIT STATUS

An application for a permit was submitted to the Department on March 3, 2003 and accepted by the Department on March 3, 2003

The Permittee holds a Washington State General Storm Water Permit # S03-003769C for the facility. Therefore, stormwater will not be addressed in this fact sheet.

SEPA COMPLIANCE

The Facility has been in existence since 1896 and is not planned for any new construction or demolition requiring SEPA.

WASTEWATER CHARACTERIZATION

The wastewater discharge is characterized for the following parameters:

Table 1: Wastewater Characterization

Parameter	Concentration
BOD	< 5mg/L
COD	17.7 mg/L
pH	6-9 std. units
Summer Temperature	16° C to 29° C
Winter Temperature	6.8° C to 16.6° C
Total Organic Carbon, TOC	1.0 mg/L
Ammonia	<0.07 mg/L
TSS	< 5mg/L

PERMIT LIMITATIONS

Federal and State regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations are based upon the treatment methods available to treat specific pollutants. Technology-based limitations are set by regulation or developed on a case-by-case basis (40 CFR 125.3, and Chapter 173-220 WAC).

Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992). The more stringent of these two limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the State of Washington were determined and included in this permit. Ecology does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation. Effluent limits are not always developed for pollutants that may be in the discharge but not reported as present in the application. In those circumstances the permit does not authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department of Ecology. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a State regulation designed to protect the beneficial uses of the surface waters of the State. Surface water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin wide total maximum daily loading study (TMDL).

Numerical Criteria for the Protection of Aquatic Life

"Numerical" water quality criteria are numerical values set forth in the State of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

Numerical Criteria for the Protection of Human Health

The U.S. EPA has promulgated 91 numeric water quality criteria for the protection of human health that are applicable to Washington State (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish consumption and drinking water from surface waters.

Narrative Criteria

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) waters in the State of Washington.

Antidegradation

The State of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when the natural conditions of a

receiving water are of higher quality than the criteria assigned, the natural conditions shall be protected. More information on the State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

The Department has reviewed existing records and is unable to determine if ambient water quality is either higher or lower than the designated classification criteria given in Chapter 173-201A WAC. Although the Columbia River is monitored for temperatures, sampling has historically occurred at dam sites and is not considered representative by either the Department or U.S. EPA. Therefore, the Department will use the designated classification criteria for this water body in the proposed permit. The discharges authorized by this permit should not cause a loss of beneficial uses.

Critical Conditions

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

AKART for Mixing Zones

The Water Quality Standards allow the Department of Ecology to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention, control and treatment (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100. Technological performance standards for temperature have not been promulgated for non-contact cooling water by the Federal Government. The temperature TMDL currently being carried out jointly by U.S. EPA and the Department is pending. Depending on the outcome of the TMDL, the Department reserves the right to require the Permittee to conduct an AKART analysis to address temperature in the discharge. The requirement for an AKART analysis, if necessary, will be contained in an Administrative Order.

The mixing zone for temperature and pH is authorized via the Water Quality Standards for a class A river. The mixing zone encompasses an area extending **322 ft** downstream of the outfall, **100 ft** upstream of the outfall with a width of **300 ft**.

DESCRIPTION OF THE RECEIVING WATER

The facility discharges to the Columbia River which is designated as a Class A receiving water in the vicinity of the outfall. Other nearby point source outfalls includes Tree Top, The Rocky Reach Dam, City of Wenatchee Sewerage Treatment Plant and the Douglas County Sewer District #1. Significant nearby non-point sources of pollutants include upstream runoff from agricultural and industrial activities. Characteristic uses include the following:

> water supply (domestic, industrial, agricultural); stock watering; fish migration; fish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation. Water quality of this class shall meet or exceed the requirements for all or substantially all uses.

The segment of the Columbia River, to which Columbia Colstor Wenatchee Main Plant discharges, is on the Department's 303(d) list for exceedances of the State's surface water standards for total dissolved gas.

SURFACE WATER QUALITY CRITERIA

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). There are no toxic pollutants contained in the discharge therefore the criteria are not addressed in this fact sheet.

CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

Surface water quality-based limits are derived for the water body's critical conditions, which represents the receiving water and wastewater discharge conditions with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants--their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating surface water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of surface water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water.

The critical condition for the Columbia River is the seven day average low river flow with a recurrence interval of ten years (7Q10). Ambient data at critical conditions in the vicinity of the Columbia Colstor Wenatchee Main Facility outfall was taken from the City of Wenatchee's Mixing Zone Study that was conducted in 1997, (NPDES Permit # WA-002394-9).

Table 5: Receiving Water Characteristics

Parameter	Value used
Width of receiving water channel	366 m (1,200 ft)
Ambient flow rate at 7Q10	1,460 m3/s (51,557 cfs)
Average depth	7.62 m (25 ft)
Depth at 7Q10	6.71 m (22 ft)
Mannings n	0.030
Temperature	15.6ºC (60ºF)

WAC 173-201A-130(21) establishes a special temperature criteria of 18.0°C for this segment of the Columbia River and details 2 tests to demonstrate compliance. The regulation states: When natural conditions exceed 18.0°C, no temperature increase will be allowed which will raise the receiving water temperature by greater than 0.3°C; nor shall such temperature increases, at any time, exceed t = 28/(T+7). The point of compliance for temperature is at the edge of the chronic mixing zone.

DILUTION FACTORS

The dilution factors of effluent from outfall # 001 to receiving water that occurs within these zones have been determined at the critical condition by the use of a simple mass balance equation and the Department's mixing zone model Rivplum 5. The dilution factors determined via the simple mass balance equation are:

Table 4: Mass Balance Dilution Factors

Mixing Zone Type	Acute	Chronic
Aquatic Life	462.9	4620.7

$$DF = \frac{Q_a + Q_e}{Q_e}$$

where,

Q_a is the volume flux of receiving (ambient) water untrained in the plume from an outfall at some sampling point in the plume; and
Q_e is the volume flux of effluent in the plume.

The Department of Ecology's Rivplum5 spreadsheet derives a more stringent chronic mixing zone dilution factor of **859.8**, (see appendix C).

Temperature--The effect of the main discharge, # 001, of approximately 1.87 MGD on the temperature of the receiving water was modeled via a simple mixing analysis and mass balance equation at the critical condition. The receiving water temperature at the critical condition is **15.6 ^{o}C**; the effluent temperature was modeled assuming a high summer value of **30 ^{o}C** with a chronic dilution factor of **4620.7**. The predicted temperature at the boundary of the chronic mixing zone is **15.603 ^{o}C.** The projected incremental rise of **0.003 ^{o}C** is well below the regulation of no increase above 0.3 ^{o}C.

Using the more stringent Rivplum5, the calculated dilution factor is **859.8**. The predicted resultant temperature at the boundary of the chronic mixing zone is **15.617 ^{o}C.** The incremental rise is **0.017 ^{o}C**, which is well below the regulation of no increase above 0.3 ^{o}C.

Under critical conditions and assuming an extremely unrealistic effluent temperature there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, no effluent limitation for temperature will be imposed at this time. The Department is requiring monitoring of temperature during the course of this permit term to determine if a temperature limit will be required in the following permit term.

The diverted defrost water, which is discharged in the City of Wenatchee's stormwater system amounts to a flow of only 0.072 MGD during the summer months. It is in the Best Professional Judgment of the Department that the defrost water flow will not cause any measurable impact to the river. Therefore, no limits or monitoring will be required at this time.

pH-- The impact of pH were modeled using the calculations from EPA, 1988. The input variables were: dilution factor **859.8**, upstream temperature **15.6** ^{o}C, upstream pH **7.7**, upstream alkalinity **59.4**(as mg $CaCO_3$/L), a summer effluent temperature **30** ^{o}C, a high end estimation effluent pH of **9**, and an effluent alkalinity of **59.4** (as mg $CaCO_3$/L). The predicted value for pH at the edge of the mixing zone is unchanged at a **pH 7.7**

Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, the limit for pH placed in the permit is the Water Quality Based pH 6-9 with monitoring to assure continued protection of the water quality.

WHOLE EFFLUENT TOXICITY

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to

the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing.

Toxicity caused by unidentified pollutants is not expected in the effluent from this discharge as determined by the screening criteria given in Chapter 173-205 WAC. Therefore, no whole effluent toxicity testing is required in this permit. The Department may require effluent toxicity testing in the future if it receives information that toxicity may be present in this effluent.

If the Permittee makes process or material changes which, in the Department's opinion, results in an increased potential for effluent toxicity, then the Department may require effluent characterization in a regulatory order, by permit modification, or in the permit renewal. Toxicity is assumed to have increased if WET testing conducted in response to rapid screening tests fails to meet the performance standards in WAC 173-205-020 "whole effluent toxicity performance standard".

Human Health

Washington’s water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the State by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the applicant's discharge is unlikely to contain chemicals regulated for human health,

Sediment Quality

The Department has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

The Department has determined through a review of the facilities activities and effluent characteristics that this discharge has no reasonable potential to violate the Sediment Management Standards.

GROUND WATER QUALITY LIMITATIONS

The Department has promulgated Ground Water Quality Standards (Chapter 173-200 WAC) to protect beneficial uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

This Permittee has no discharge to ground; therefore, no limitations are required based on potential effects to ground water.

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

Monitoring of **Temperature and pH** is being required to further characterize the effluent at outfall #001. Monitoring of **pH** at outfall is required at outfall #002.

As there are no water seals in the cooling system, leakage of ammonia, short of a catastrophic failure, is not expected. The facility monitors for ammonia on a regular basis. At this time the Department is not requiring ammonia monitoring, however the Department may through permit modification or Administrative Order require ammonia monitoring

The monitoring schedule is detailed in this permit under Special Condition S.2. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring.

The Department may grant a reduction in sampling frequency if, after one year of monitoring, the Permittee submits a request with data to support there is no risk of a discharge at a pH beyond the Water Quality Based Limits.

LAB ACCREDITATION

With the exception of certain parameters, (Temperature and pH), the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories*

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The requirements of Special Condition S3. are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

SPILL PLAN

The Department has determined that the Permittee stores a quantity of chemicals that have the potential to cause water pollution if accidentally released. The Department has the authority to require the Permittee to develop best management plans to prevent this accidental release under section 402(a)(1) of the Federal Water Pollution Control Act (FWPCA) and RCW 90.48.080.

Special Condition S5. of this permit requires the Permittee to develop and implement a plan for preventing the accidental release of pollutants, primarily ammonia, to State waters and for minimizing damages if such a spill occurs.

OUTFALL 001 EVALUATION

Special Condition S6. requires the Permittee to conduct an outfall inspection and submit a report detailing the findings of that inspection and a photo of the outfall if possible. The purpose of the inspection is to determine the condition of the discharge pipe and diffusers and to evaluate the extent of sediment accumulations in the vicinity of the outfall.

A detailed site plan that clearly indicates the location of the discharge system, the distance of travel from the plant to the diffuser, manhole locations, sampling station, the distance of the diffuser from the river bank and depth of diffuser is required as part of the outfall evaluation.

GENERAL CONDITIONS

General Conditions are based directly on State and Federal law and regulations and have been standardized for all individual industrial NPDES permits issued by the Department.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards for Surface Waters, Sediment Quality Standards, or Water Quality Standards for Ground Waters, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended State or Federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to control toxics, protect human health, aquatic life, and the beneficial uses of waters of the State of Washington. The Department proposes that this proposed permit be issued for five (5) years.

REFERENCES FOR TEXT AND APPENDICES

Environmental Protection Agency (EPA)

1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.

1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.

1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.

1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.

1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.

Tsivoglou, E.C., and J.R. Wallace.

1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Washington State Department of Ecology.

1994. Permit Writer's Manual. Publication Number 92-109

Washington State Department of Ecology.

Laws and Regulations(http://www.ecy.wa.gov/laws-rules/index.html)

Permit and Wastewater Related Information (http://www.ecy.wa.gov/programs/wq/wastewater/index.html

Wright, R.M., and A.J. McDonnell.
1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(EE2). (Cited in EPA 1985 op.cit.)

APPENDIX A -- PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to issue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

The Department will publish a Public Notice of Draft (PNOD) on August 14, 2003 in the Wenatchee World to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Coordinator
Department of Ecology
Central Regional Office
15 West Yakima Avenue, Suite 200
Yakima, WA 98902

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the thirty (30) day comment period to the address above. The request for a hearing shall indicate the interest of the party and reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least thirty (30) days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within thirty (30) days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, 509/457-7105 or by writing to the address listed above.

This fact sheet and the proposed permit were written by Richard Marcley.

APPENDIX B -- GLOSSARY

Acute Toxicity--The lethal effect of a compound on an organism that occurs in a short period of time, usually 48 to 96 hours.

AKART-- An acronym for "all known, available, and reasonable methods of treatment".

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation --The average of the measured values obtained over a calendar month's time.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD_5--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD_5 is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of a treatment facility.

Chlorine--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity--The effect of a compound on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean Water Act (CWA)--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Compliance Inspection - Without Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Additional sampling may be conducted.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

Construction Activity--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Continuous Monitoring –Uninterrupted, unless otherwise noted in the permit.

Critical Condition--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Dilution Factor--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the percent effluent fraction e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Engineering Report--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Major Facility--A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum Daily Discharge Limitation--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

Minor Facility--A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone--An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in State regulations (Chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES)--The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Quantitation Level (QL)-- A calculated value five times the MDL (method detection level).

Responsible Corporate Officer-- A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or have gross annual sales or expenditures exceeding $25 million (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures (40 CFR 122.22).

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the State of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)--Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Upset--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit--A limit on the concentration of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C -- TECHNICAL CALCULATIONS

Spread of a plume from a point source in a river with boundary effects from the shoreline based on the method of Fischer *et al.* (1979) with correction for the effective origin of effluent.

Revised 22-Feb-96

INPUT	
1. Effluent Discharge Rate (cfs):	2.90
2. Receiving Water Characteristics Downstream From Waste Input	
Stream Depth (ft):	22.00
Stream Velocity (fps):	1.95
Channel Width (ft):	80.00
Stream Slope (ft/ft) or Manning roughness "n":	0.03
0 if slope or 1 if Manning "n" in previous cell:	1
3. Discharge Distance From Nearest Shoreline (ft):	40
4. Location of Point of Interest to Estimate Dilution	
Distance Downstream to Point of Interest (ft):	300
Distance From Nearest Shoreline (ft):	40
5. Transverse Mixing Coefficient Constant (usually 0.6):	0.6
6. Original Fischer Method (enter 0) or *Effective Origin* Modification (enter 1)	0
OUTPUT	
1. Source Conservative Mass Input Rate	
Concentration of Conservative Substance (%):	100.00
Source Conservative Mass Input Rate (cfs*%):	279.00
2. Shear Velocity	
Shear Velocity based on slope (ft/sec):	#N/A
Shear Velocity based on Manning "n":	
using Prasuhn equations 8-26 and 8-54 assuming	
Hydraulic radius equals depth for wide channel	
Darcy-Weisbach friction factor "f":	0.037
Shear Velocity from Darcy-Weisbach "f" (ft/sec):	0.133
Selected Shear Velocity for next step (ft/sec):	0.133
3. Transverse Mixing Coefficient (ft2/sec):	1.757

4. Plume Characteristics Accounting for Shoreline Effect (Fischer *et al.*, 1979)

Co	5.42E-03
x'	1.88E-04
y'o	3.33E-02
y' at point of interest	3.33E-02
Solution using superposition equation (Fischer eqn 5.9)	
Term for n= -2	0.00E+00
Term for n= -1	0.00E+00
Term for n= 0	1.00E+00
Term for n= 1	0.00E+00
Term for n= 2	0.00E+00
Upstream Distance from Outfall to *Effective Origin* of Effluent Source (ft)	#N/A
Effective Distance Downstream from Effluent to Point of Interest (ft)	300.00
x' Adjusted for *Effective Origin*	1.88E-04
C/Co (dimensionless)	2.06E+01
Concentration at Point of Interest (Fischer Eqn 5.9)	1.12E-01
Unbounded Plume Width at Point of Interest (ft)	93.001
Unbounded Plume half-width (ft)	46.500
Distance from near shore to discharge point (ft)	40.00
Distance from far shore to discharge point (ft)	1160.00
Plume width bounded by shoreline (ft)	86.50
Approximate Downstream Distance to Complete Mix (ft):	597,415
Theoretical Dilution Factor at Complete Mix:	18,451.613
Calculated Flux-Average Dilution Factor Across Entire Plume Width:	1330.058
Calculated Dilution Factor at Point of Interest:	**859.8**

Calculation of pH of a mixture of two flows. Based on the procedure in EPA's DESCON program (EPA, 1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington D.C.)
Based on Lotus File PHMIX2.WK1 Revised 19-Oct-93

INPUT	
1. DILUTION FACTOR AT MIXING ZONE BOUNDARY	**859.8**
1. UPSTREAM/BACKGROUND CHARACTERISTICS	
Temperature (deg C):	15.60
pH:	7.70
Alkalinity (mg CaCO3/L):	59.40
2. EFFLUENT CHARACTERISTICS	
Temperature (deg C):	30.00
pH:	9.00
Alkalinity (mg CaCO3/L):	59.40
OUTPUT	
1. IONIZATION CONSTANTS	
Upstream/Background pKa:	6.42
Effluent pKa:	6.32
2. IONIZATION FRACTIONS	
Upstream/Background Ionization Fraction:	0.95
Effluent Ionization Fraction:	1.00
3. TOTAL INORGANIC CARBON	
Upstream/Background Total Inorganic Carbon (mg CaCO3/L):	62.48
Effluent Total Inorganic Carbon (mg CaCO3/L):	59.53
4. CONDITIONS AT MIXING ZONE BOUNDARY	
Temperature (deg C):	15.62
Alkalinity (mg CaCO3/L):	59.40
Total Inorganic Carbon (mg CaCO3/L):	62.48
pKa:	6.41
pH at Mixing Zone Boundary:	7.70

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on the Department's homepage at http://www.ecy.wa.gov.

Simple Mass Balance and DF calculator spreadsheet:

CHRONIC DILUTION

eff flow	eff conc	rw flow	rw conc	**final conc**	**dil factor**
2.79	30	12889	15.6	15.603	4620.71326

Mass Balance following river flow adjustment to accommodate
the Rivplum5 derived D.F. of 893.7

eff flow	eff conc	rw flow	rw conc	**final conc**	**dil factor**
2.79	30	2490.7	15.6	15.616	893.724014

Final conc. after forcing the model with an extreme temp. of 100 °C

eff flow	eff conc	rw flow	rw conc	**final conc**	**dil factor**
2.79	100	2490.7	15.6	15.694	893.724014

APPENDIX D -- RESPONSE TO COMMENTS

No comments were received by the Department of Ecology