

**FACT SHEET FOR STATE WASTE DISCHARGE
PERMIT NO. ST-9226**

DALLESPORT WASTEWATER TREATMENT FACILITY

**DATE OF THIS FACT SHEET – SEPTEMBER 4, 2007
DATE OF EXPIRING PERMIT - NOVEMBER 30, 2012**

SUMMARY

Klickitat County is seeking a new State Wastewater Discharge permit for its wastewater treatment facility in Dallesport, WA. Dallesport is an unincorporated community in southern Klickitat County. The community is estimated to have about 1,000 residents. It is located just north of the Columbia River, across from The Dalles, Oregon.

The County submitted its first application for a State Waste Discharge permit in 2001. A temporary state waste discharge permit was issued on August 4, 2002. The County submitted a renewal permit application in October 2006.

The facility discharges treated wastewater to the sub-surface soil profile through a 300 foot long, perforated pipe, located adjacent to the Columbia River.

The permit establishes effluent limits and monitoring requirements necessary to ensure compliance with the State's water quality standards.

Klickitat County owns the treatment plant and the City of Bingen provides the operation and maintenance of the plant. The relationship between the owner and operator is formalized in the Agreement Regarding Operation and Maintenance of Dallesport Wastewater Facilities between Klickitat County and the City of Bingen. The current agreement is effective through December 31, 2007. As the operator of the Dallesport treatment plant, the City is responsible for the operation, monitoring, and reporting provisions of the draft permit. Therefore, the permit establishes **Klickitat County and the City of Bingen as a co-permittees**, with both entities jointly responsible for compliance with the permit.

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INTRODUCTION

This fact sheet is a companion document to the draft State Waste Discharge Permit No. ST-9226. The Department of Ecology (Ecology) is proposing to issue this permit, which will allow discharge of wastewater to waters of the State of Washington. This fact sheet explains the nature of the proposed discharge, Ecology's decisions on limiting the pollutants in the wastewater, and the regulatory and technical bases for those decisions.

Washington State law (RCW 90.48.080 and 90.48.162) requires that a permit be issued before discharge of wastewater to waters of the state is allowed. Regulations adopted by the State include procedures for issuing permits (Chapter 173-216 WAC), technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 WAC) and water quality criteria for ground waters (Chapter 173-200 WAC). They also establish the basis for effluent limitations and other requirements which are to be included in the permit.

This fact sheet and draft permit are available for review by interested persons as described in Appendix A--Public Involvement Information.

The fact sheet and draft permit have been reviewed by the **Office of Environmental Health & Safety** of the Washington State Department of Health and by the Permittees. Errors and omissions identified in these reviews have been corrected before going to public notice. After the public comment period has closed, Ecology 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 Ecology's response. The fact sheet will not be revised. Changes to the permit will be addressed in Appendix E--Response to Comments.

GENERAL INFORMATION	
Applicant	Klickitat County
Facility Name and Address	Dallesport Wastewater Treatment Facility 440 Dock Road Dallesport, WA 98617
Type of Treatment System:	Activated sludge, clarification, with effluent infiltration drainfield.
Discharge Location	Latitude: 45° 37' 09" N Longitude: 121° 08' 06"W (NAD83/WGS84)
Legal Description of Application Area	NW¼ of the NW¼ Section 36, Township 2N, Range 13E
Contact at Facility	Name: Mike Robarge Telephone No.: 509-767-2132
Responsible Official	Name: Scott Smith Title: Klickitat County Public Works Director Address: 228 West Main Street, MS-CH-19 Goldendale, WA 98620 Telephone No.: 509-773-2374

BACKGROUND INFORMATION

DESCRIPTION OF THE COLLECTION AND TREATMENT SYSTEM

History

In the 1990's, Klickitat County initiated investigations to address the problem of failing septic drain fields in the Dallesport area. The geology of the area is poorly suited to septic drainfields due to high water tables and marginal soil conditions. To address the problem, the County produced a January 1999 General Sewer Plan (KCM, Incorporated) which provided potential solutions to the problem. The plan recommended that a centralized wastewater treatment plant be built. The plan raised concerns about the discharge of treated wastewater (effluent) to the Columbia River, given the uncertain regulatory nature of the Columbia River and Endangered Species Act. Therefore, the plan recommended the examination of the feasibility of a year-round, groundwater effluent discharge. The Dallesport Wastewater Facility Plan produced in May of 2000, chose the present plant's design as the preferred alternative.

The proposal also promulgated the need for an Environmental Impact Statement. Klickitat County produced the Dallesport Area Wastewater Treatment System Final Environmental Impact Statement (EIS) in March 2001. The EIS concluded that the proposal would not cause damages to the environment. The EIS concluded that the proposed subsurface discharge design was found to be protective of surface water. Furthermore, no adverse environmental impacts to groundwater were projected.

Construction of the wastewater treatment plant was completed in 2002. This fact sheet accompanies a new State Wastewater Discharge permit.

Klickitat County and the City of Bingen have a formal agreement for the operation and maintenance of the plant. This relationship is formalized in the Agreement Regarding Operation and Maintenance of Dallesport Wastewater Facilities between Klickitat County and the City of Bingen. The current agreement is effective through December 31, 2007. Therefore, the permit establishes the City of Bingen as a co-permittee with the County. In effect, this means that the two entities are jointly responsible for compliance with the permit.

Table 1. Timeline of Events

Event / Document	Date	Author
Dallesport Area General Sewer Plan	January 1999	KCM, Inc.
Dallesport Wastewater Facility Plan	May 2000	Kennedy/Jenks Consultants
Dallesport Area Wastewater Treatment System Final Environmental Impact Statement (EIS)	March 2001	Klickitat County Planning Department
Ground Breaking Ceremony	September 2001	
Ribbon Cutting Ceremony for the 95% complete facility	December 2002	
Dallesport Wastewater Treatment Facility As Built Engineering Drawings and Specifications	June 2003	Kennedy/Jenks Consultants

Collection System Status

Construction of the collection system occurred in 2002 at the same time as the wastewater treatment plant. It is referred to as a hybrid collection system in the facility plan because it includes both gravity flow and pressurized sections. The collection system has about 375 connections. Its main components are 2 lift stations, 7 miles of gravity pipe, and 2.5 miles of force main.

Treatment Processes

- Collection System – Gravity/Grinder Hybrid
- Preliminary Treatment – Fine Screening and Grit Removal
- Secondary Treatment – Oxidation Ditch
- Disinfection – Ultraviolet
- Sludge Treatment – Aerobic Digestion
- Biosolids Dewatering – Drying Beds
- Effluent Disposal – Subsurface Riparian Discharge

Infiltration Distribution System

The subsurface, land application area is located adjacent to the Columbia River, near the Dalles Dam's navigation locks. The soil profile in the effluent distribution area consists of gravelly soil, with high hydraulic transmission capability. The subsurface wastewater PVC distribution pipe is 15-inches in diameter and 300 feet long. The pipe is buried at a depth of 4 feet. Treated wastewater exits the perforated pipe through ½-inch holes drilled 10-inches on center. The distribution pipe has a valve in the middle that exists to distribute wastewater to half the pipe at any one time. To date, only the west half of the 300 foot pipe has been utilized. **The proposed permit requires that the distribution area be switched each year.**

A primary benefit (treatment effect) of the subsurface disposal is the cooling that occurs to the wastewater prior to mixing with surface water. Wastewater is cooled in the hyporheic zone prior to merging with river water. Since the Columbia River is temperature impaired, the subsurface cooling mitigates the impact on the river.

Residual Solids

The treatment facilities remove solids during the treatment of the wastewater at the headworks (grit and screenings), and at the primary and secondary clarifiers, in addition to incidental solids (rags, scum, and other debris) removed as part of the routine maintenance of the equipment. Grit, rags, scum and screenings are drained and disposed of as solid waste at the local landfill.

Ecology issued coverage under the State's Biosolids General Permit to Klickitat County in November 2006 for biosolids produced at the treatment plant. The Biosolids General Permit regulates land application of aerobically treated solids removed from the secondary clarifier.

GROUND WATER

The facility's application included Appendix A – Subsurface Discharge Operating Limitations:

1. The subsurface discharge system shall be maintained in good repair.
2. Routine inspections of the discharge area will be used to identify and correct unanticipated operating conditions: surfaced wetness, signs of subsidence or erosion, unanticipated vegetative growth.
3. Routine inspections of the Columbia River shoreline adjacent to the discharge area will be performed to identify and correct unanticipated operating conditions: surface wetness, signs of erosion, unusual vegetative growth or biological activity.

The facility's O&M manual contains a section entitled 3.14 Effluent Disposal. Section 3.14.3 Normal Process Operation sets forth the operating parameters given above. The permit requires that this section of the O&M manual be appended with instructions to annually switch sides of the distribution pipe.

PERMIT STATUS

An Application For A Wastewater Discharge Permit Of Municipal Wastewater To Ground Water was submitted by Klickitat County on June 27, 2001 and accepted June 13, 2002. The acceptance of the application is the regulatory basis for issuance of a temporary wastewater discharge permit. A temporary permit was issued on August 4, 2002. The intent of Ecology was to gather ground water monitoring data in order to determine specific conditions and limitations to incorporate into a wastewater discharge permit.

An application for permit renewal was submitted to Ecology on October 5, 2006 and accepted by Ecology on October 26, 2006.

SUMMARY OF COMPLIANCE WITH THE TEMPORARY PERMIT

The facility last received an inspection on February 22, 2007. During the history of the temporary permit, the Permittee has remained in compliance, having conducted all necessary sampling to characterize the impact of the sub-surface discharge.

WASTEWATER CHARACTERIZATION

The concentration of pollutants in the discharge was reported in the permit application and in discharge monitoring reports. The wastewater discharge prior to infiltration is characterized for the following parameters:

Table 1: Wastewater Effluent Characterization January 2004 to December 2006

Parameter	Average Concentration (or rate)
Flow	76,600 gallons per day
Five-day biochemical demand (BOD ₅)	2.4 mg/L
Total Suspended Solids (TSS)	2.0 mg/L
Total Kjeldahl Nitrogen (TKN)	1.3 mg/L
Ammonia	0.2 mg/L
Nitrate	6.4 mg/L
Ortho-phosphate (Ortho-P)	4.9 mg/L
Dissolved Oxygen	6.0 mg/L
Conductivity	558 micro Siemens /cm
Fecal Coliforms	1.6 colonies/100ml geometric mean
pH minimum/maximum	7.3 / 7.6 standard units
Temperature	16.1° Celsius

SEPA COMPLIANCE

A State Environmental Policy Act (SEPA) checklist for the Dallesport General Sewer Plan was prepared and signed January 1999. The name of the applicant and sponsoring agency was Klickitat County.

A SEPA checklist for the Dallesport Wastewater System was prepared and signed May 2000. The name of the applicant and sponsoring agency was Klickitat County. Based on the SEPA, the County issued a Determination of Significance for the project which required the completion of an environmental impact statement.

On March 2, 2001 a Final Environmental Impact Statement (FEIS) was issued by the Klickitat County Planning Department for the proposed Dallesport Wastewater Treatment Facility. The FEIS addressed potentially significant environmental issues for the project which included:

- Potential surface water quality impacts,
- Location of the treatment facility,
- Temporary effects of facility and pipeline construction and,
- Effects related to induced growth in the community.

PROPOSED PERMIT LIMITATIONS

State regulations require that limitations set forth in a waste discharge permit must be either technology- or water quality-based. Wastewater must be treated using all known, available, and reasonable methods of prevention, control, and treatment (AKART) and not pollute the waters of the State. The minimum requirements to demonstrate compliance with the AKART standard are derived from the *Design Criteria for Municipal Wastewater Land Treatment*, and Chapter 173-221 WAC.

The permit also includes limitations on the quality of the wastewater applied to the drainfield that have been determined to protect the quality of the ground water. The approved engineering report includes specific design criteria for this facility. Water quality-based limitations are based upon compliance with the Ground Water Quality Standards (Chapter 173-200 WAC).

Ecology must decide if the discharge of pollutants into the ground near a surface water is subject to an National Pollutant Discharge Elimination System (NPDES) permit or State Waste discharge permit. Ecology believes the best guidance on this issue comes from the United States District Court Eastern District of Washington (*Washington Wilderness Coalition v. Hecla Mining*, 870 F. Supp 983, 990). The court held that “since the goal of the Clean Water Act (CWA) is to protect the quality of surface waters, any pollutant which enters such waters, whether directly or through groundwater, is subject to regulation by NPDES permit.” The court went on to hold, “[I]t is not sufficient to allege groundwater pollution, and then to assert a general hydrological connection between all waters. Rather, pollutants must be traced from their source to surface waters, in order to come within the purview of the CWA.”

The decision on hydraulic continuity is dependent upon the pollutant (type and mobility in soils), the pollutant loading, the soils at the site, and the hydrology of the site. At sites where it is difficult to make a determination, Ecology requires the dischargers to do appropriate monitoring and analysis to determine whether pollutants discharged to the ground(water) can be traced to surface water. Ecology has determined that ground water monitoring data collected to date demonstrate that surface water quality is protected. Furthermore, the limitations set forth in the proposed permit are sufficient to continue protecting surface water quality.

The more stringent of the water quality-based or technology-based limits are applied to each of the parameters of concern. Each of these types of limits is described in more detail below.

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

All waste discharge permits issued by Ecology must specify conditions requiring all known, available and reasonable methods of prevention, control, and treatment of discharges to waters of the state (WAC 173-216-110). AKART for this facility is defined by the design criteria given in the engineering specifications of the Dallesport Wastewater System Final Preliminary Design

Report (October 2000). Additionally, technology-based discharge standards for municipal wastewater facilities are given in WAC 173-221-040.

The following permit limitations are necessary to satisfy the requirement for AKART:

Table 2: Technology-based Effluent Limitations

Parameter	Average Monthly	Average Weekly
5-day Biochemical Oxygen Demand (BOD ₅)	30 mg/L	45 mg/L
Total Suspended Solids (TSS)	30 mg/L	45 mg/L
Fecal Coliform Bacteria ^a	100 colonies/100ml geometric mean	200 colonies/100ml geometric mean
Daily Limit		
pH ^a	Shall not be outside the range of 6.5 to 8.5	
^a Water quality standard for lower Columbia River.		

GROUND WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's ground waters including the protection of human health, WAC 173-200-100 states that waste discharge permits shall be conditioned in such a manner as to authorize only activities that will not cause violations of the Ground Water Quality Standards. Drinking water is the beneficial use generally requiring the highest quality of ground water. Providing protection to the level of drinking water standards will protect a great variety of existing and future beneficial uses.

Table 3 presents applicable ground water criteria as defined in Chapter 173-200 WAC and in RCW 90.48.520 for this discharge.

Table 3: Ground Water Quality Criteria

Parameter	Criteria
Chloride	250 mg/L
Nitrate	10 mg/L
Toxics	No toxics in toxic amounts

The State has adopted a Ground Water Quality regulation for Total Coliform Bacteria of 1 colony forming unit per 100 milliliter sample of ground water (1CFU/100ml). The State has adopted an even more stringent regulatory level for fecal coliform (and E. coli) of 0 CFU/100ml. However, these regulations are intended to protect human health by preventing contamination of drinking water wells. There are no drinking water wells located between the subsurface disposal

site and the Columbia River. The Dallesport treatment plant utilizes ultra-violet disinfection of its wastewater. This technology is considered AKART for wastewater disinfection. As shown in Table 1, the Permittee has achieved high levels of disinfection. Therefore, the proposed permit adopts fecal coliform criteria from the surface water quality standards for primary contact recreation (WAC 173-201A-200 (2)(b)).

Data have been analyzed from ground water monitoring conducted downgradient and upgradient from the disposal site during the period January 2003 through March 2007. Results of the monitoring has shown that downgradient pollutants are not present at concentrations greater than those upgradient from the disposal site. The proposed permit requires surface water monitoring that will show if surface water quality is being adversely affected. The monitoring results will help determine whether a NPDES permit is required after the expiration of this proposed permit.

Six monitoring wells were installed in the vicinity of the proposed discharge for the 2001 Environmental Impact Statement baseline water quality measurements. Beginning in August 2001, baseline data were collected monthly until October 2003, when the baseline monitoring program was changed to quarterly for operational monitoring. Currently four wells are sampled quarterly for water quality data while Monitoring Wells (MW) 1 & 6 only yield water level data. Water quality data are obtained from Monitoring Wells 2, 3, and 5, which were installed adjacent to the discharge pipe to collect compliance data. Monitoring Well 4 was installed to represent upgradient, or background, ground water quality conditions. Data from this well were used to calculate ground water permit limits as shown in Table 4.

Table 4: Upgradient Ground WQ In MW 4 and Permit Limits

Parameter	Range	Mean Value	Std Deviation	Permit Limit (MW 2, 3, & 5)
Temperature (°C)	9.5 – 19.6	14.8	3.1	19.6 ^a
Ortho-P (mg/L)	0.07 – 1.37	0.44	0.33	1.77 ^a
NO3-N (mg/L)	0.24 – 7.33	3.09	2.19	7.33
Cl (mg/L)	4.5 – 157	57.5	46.7	245
pH	6.7 to 8.7	N.A. ^b	N.A.	N.A.
^a The temperature and Ortho-P limits are not based on numeric criteria. These are limits designed to prevent adverse effects to the characteristic water uses, which may cause acute or chronic conditions harmful to the aquatic biota, or adversely affect public health.				
^b N.A. means not applicable				

An exceedance of a permit limit is defined as two successive analyses above the limit in Monitoring Well 2, 3, or 5. In the event of an exceedance, the permit will require the Permittee to notify Ecology and resample the well. Ecology may require the Permittee to prepare a report that documents the exceedance and discusses the steps to be used to achieve compliance.

A more in depth discussion and statistical analysis of these ground water quality based limits is presented in Appendix C – Technical Calculations.

Antidegradation

The State of Washington's Ground Water Quality Standards require that beneficial uses of ground water be preserved. It also requires that discharges to ground water shall not further degrade the existing water quality of the ground water. In cases where the natural conditions of a ground water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when ground waters are of higher quality than the criteria assigned, the existing water quality shall be protected. More information on the Antidegradation Policy can be obtained by referring to WAC 173-200-030.

The Permittee is required in section S2. of the proposed permit to continue to collect background and downgradient groundwater concentrations near the point of discharge. Ecology does not have ground water data for all pollutants of concern. The permit requires additional monitoring for these constituents. This information may result in a permit modification or limits in the next renewal.

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are specified to verify that the treatment process is functioning correctly, that ground water criteria are not violated, and that effluent limitations are being achieved (WAC 173-216-110).

INFLUENT AND EFFLUENT MONITORING

The monitoring and testing schedule is detailed in the proposed permit under Condition S2. 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.

Monitoring for a suite of parameters is being required to further characterize the effluent. These pollutants could have a significant impact on the quality of the ground water. The permit includes a requirement to monitor for Total Residual Chlorine. This monitoring requirement is intended to be in effect only when sodium hypochlorite is used in process control, which is expected to occur only occasionally.

GROUND WATER MONITORING

The monitoring of ground water at the site is required in accordance with the Ground Water Quality Standards, Chapter 173-200 WAC. Ecology has determined that this discharge has a potential to pollute the ground water. Therefore, the Permittee is required to evaluate the impacts on ground water quality.

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The conditions of S3. are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-216-110).

FACILITY LOADING

Table 5 contains the design criteria for this treatment facility are taken from the June 2003 engineering report prepared by Kennedy/Jenks Consultants and are as follows:

Table 5: Facility Loading Criteria

Parameter	Flow /Loading
Average Annual Flow	0.27 mgd
Monthly average flow (max. month):	0.40 mgd
Maximum Daily Flow:	0.67 mgd
Peak Hour Flow	1.07 mgd
BOD ₅ influent loading:	520 lbs/day
TSS influent loading:	520 lbs/day
Ammonia influent loading	134 lbs/day

The permit requires the Permittee to maintain adequate capacity to treat the flows and waste loading to the treatment plant (WAC 173-216-110[4]). The Permittee is required to submit an engineering report when the plant reaches 85% of its flow or loading capacity. For significant new discharges, the permit requires a new application and an engineering report (WAC 173-216-110[5]). The permit requires the Permittee to submit a wasteload assessment report comparing the actual flow and waste loadings to the design criteria for the plant.

OPERATIONS AND MAINTENANCE

The proposed permit contains condition S5. as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment. The proposed permit requires submission of an updated O&M manual for the entire wastewater system.

RESIDUAL SOLIDS HANDLING

To prevent water pollution, the Permittee is required in permit condition S6. to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and State Water Quality Standards.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503 and by Ecology under Chapter 70.95J RCW and Chapter 173-208 WAC. The disposal of other solid waste is under the jurisdiction of the local health district.

PRETREATMENT

WAC 173-216-110 requires that the list of prohibitions in WAC 173-216-060 be included in the permit.

Federal pretreatment requirements in 40 CFR 403 and Sections 307(b) and 308 of the Clean Water Act apply to this facility. Therefore, notification to Ecology is required when pretreatment prohibitions are violated and when new sources of commercial or industrial wastewater discharge are added to its system.

An industrial/commercial user survey is required to determine the extent of compliance of all industrial/commercial users of the sanitary sewer and wastewater treatment facility with federal pretreatment regulations (40 CFR Part 403 and Sections 307(b) and 308 of the Clean Water Act), with state regulations (Chapter 90.48 RCW and Chapter 173-216 WAC), and with local ordinances.

GENERAL CONDITIONS

General Conditions are based directly on state laws and regulations and have been standardized for all industrial waste discharge to ground water permits issued by Ecology.

- Condition G1. requires responsible officials or their designated representatives to sign submittals to Ecology.

- Condition G2. requires the Permittee to allow Ecology to access the treatment system, production facility, and records related to the permit.
- Condition G3. specifies conditions for modifying, suspending or terminating the permit.
- Condition G4. requires the Permittee to apply to Ecology prior to increasing or varying the discharge from the levels stated in the permit application..
- Condition G5. requires the Permittee to submit written notice of significant increases in the amount or nature of discharges (typically new industrial discharges) into the sewer system tributary to the permitted facility.
- Condition G6. requires the Permittee to construct, modify, and operate the permitted facility in accordance with approved engineering documents.
- Condition G7. prohibits the Permittee from using the permit as a basis for violating any laws, statutes or regulations.
- Condition G8. requires the payment of permit fees.
- Condition G9. describes the penalties for violating permit conditions.

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, and to protect human health and the beneficial uses of waters of the State of Washington. Ecology proposes that the permit be issued for five years.

REFERENCES FOR TEXT AND APPENDICES

Faulkner, S.P., Patrick Jr., W.H., Gambrell, R.P., May-June, 1989. Field Techniques for Measuring Wetland Soil Parameters, Soil Science Society of America Journal, Vol. 53, No.3.

KCM, Incorporated, January 1999. Klickitat County – Dallesport Area General Sewer Plan

Kennedy/Jenks Consultants, October 2000. Dallesport Wastewater System Final Preliminary Design Report. [prepared for Klickitat County Resource Development Department]

Kennedy/Jenks Consultants, June 2003. Dallesport Wastewater System Final Preliminary Design Report. [prepared for Klickitat County Resource Development Department]

Klickitat County Planning Department, March 2001. Final Environmental Impact Statement: Dallesport Area Wastewater Treatment System; Klickitat County, Washington.

Washington State Department of Ecology, 1993. Guidelines for Preparation of Engineering Reports for Industrial Wastewater Land Application Systems, Ecology Publication # 93-36. 20 pp.

Washington State Department of Ecology, 1996. Implementation Guidance for the Ground Water Quality Standards, Ecology Publication # 96-02.

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>)

Washington State Department of Ecology and Department of Health, 1997. Water Reclamation and Reuse Standards, Ecology Publication # 97-23. 73 pp.

Washington State Department of Health, February 1994. Design Criteria for Municipal Wastewater Land Treatment, 11 pp.

APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

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

Public notice of application was published on June 21, 2007 in the White Salmon Enterprise and the Goldendale Sentinel to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

Ecology will publish a Public Notice of Draft (PNOD) on September 13, 2007 in the Goldendale Sentinel 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 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. Ecology will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-216-100). Public notice regarding any hearing will be circulated at least 30 days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing.

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.

Ecology will consider all comments received within 30 days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. Ecology'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 Ecology by telephone, 509/457-7105, or by writing to the address listed above.

This permit was prepared by Jim Leier.

APPENDIX B--GLOSSARY

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.

BOD₅--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 BOD₅ 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 the collection or treatment facility.

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

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.

Distribution Uniformity--The uniformity of infiltration (or application in the case of sprinkle or trickle irrigation) throughout the field expressed as a percent relating to the average depth infiltrated in the lowest one-quarter of the area to the average depth of water infiltrated.

Engineering Report--A document, signed by a professional licensed engineer, 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.

Hyporheic -- The zone near and under a stream or river where groundwater and surface water mix.

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.

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.

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).

Soil Scientist--An individual who is registered as a Certified or Registered Professional Soil Scientist or as a Certified Professional Soil Specialist by the American Registry of Certified Professionals in Agronomy, Crops, and Soils or by the National Society of Consulting Scientists or who has the credentials for membership. Minimum requirements for eligibility are: possession of a baccalaureate, masters, or doctorate degree from a U.S. or Canadian institution with a minimum of 30 semester hours or 45 quarter hours professional core courses in agronomy, crops or soils, and have 5,3,or 1 years, respectively, of professional experience working in the area of agronomy, crops, or soils.

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 Coliform Bacteria--A microbiological test which detects and enumerates the total coliform group of bacteria in water samples.

Total Dissolved Solids--That portion of total solids in water or wastewater that passes through a specific filter.

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.

Water Quality-based Effluent Limit--A limit on the concentration of an effluent parameter that is intended to prevent pollution of the receiving water.

APPENDIX C--TECHNICAL CALCULATIONS

Dallesport FS Addendum for Ground Water Quality-Based Effluent Limitations

Six monitoring wells were installed in the vicinity of the proposed discharge for EIS baseline water quality measurements. Beginning in August 2001, baseline data were collected monthly until October 2003, when the baseline monitoring program was changed to quarterly for operational monitoring. Currently four wells are sampled quarterly for water quality data while Monitoring Wells 1 & 6 only yield water level data. Water quality data are obtained from Monitoring Wells 2, 3, and 5, which were installed adjacent to the discharge pipe to collect compliance data. Monitoring Well 4 was installed to represent upgradient, or background, ground water quality conditions. Data from this well were used to calculate ground water permit limits.

Table 4: Upgradient Ground WQ in MW 4 and Permit Limits

Parameter	Range	Mean Value	Std Deviation	Permit Limit (MW 2, 3, & 5)
Temperature (°C)	9.5 – 19.6	14.8	3.1	19.6
Ortho-P (mg/L)	0.07 – 1.37	0.44	0.33	1.77 ^a
NO3-N (mg/L)	0.24 – 7.33	3.09	2.19	7.33 ^a
Chloride (mg/L)	4.5 – 157	57.5	46.7	245
^a The temperature and Ortho-P limits are narrative limits and are not based on numeric criteria. These are limits designed to prevent adverse effects to the characteristic water uses, which may cause acute or chronic conditions harmful to the aquatic biota, or adversely affect public health.				

The operational background water quality data from Monitoring Well 4 were used to obtain the permit limits for the critical parameters of temperature, Ortho-Phosphate, chloride, and nitrate (NO3-N). The data were entered into the statistical program Sanitas, and examined using the procedures contained in the *Implementation Guidance for the Ground Water Standards* (Ecology Publication 96-02, April 1996). Calculations made following the *Implementation Guidance* result in an upper tolerance limit, which represents the permit limit in ground water.

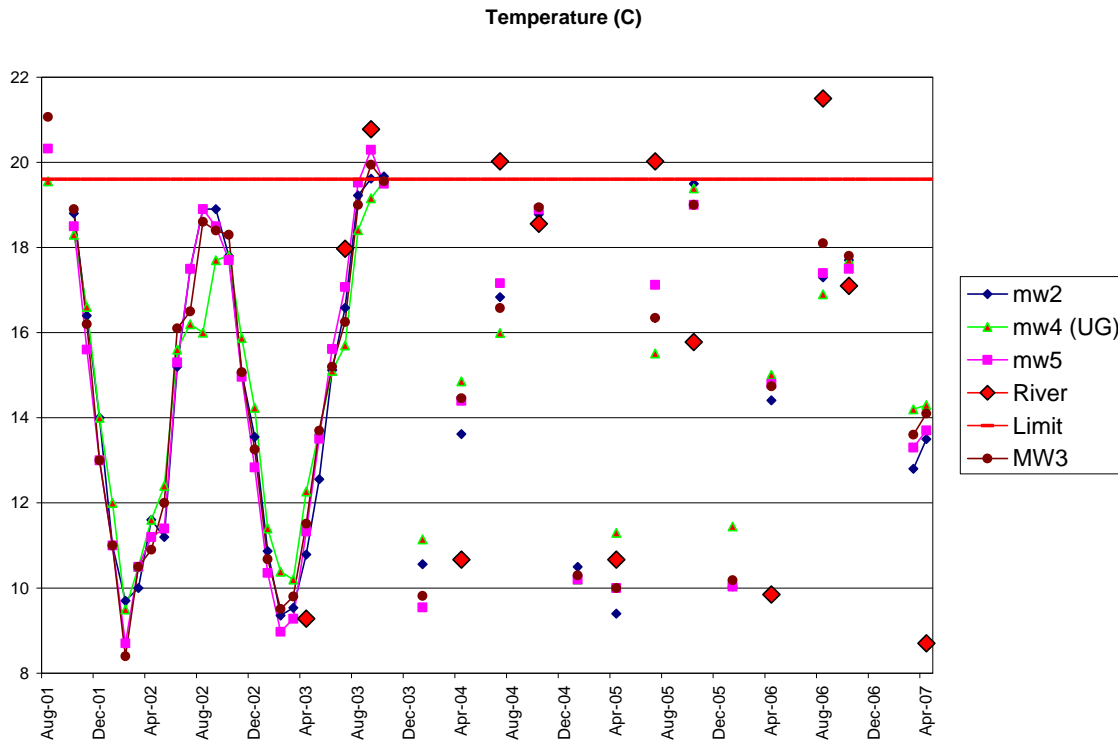
For permit limit calculations, the data for the parameters Ortho-P and chloride were statistically examined, tested, and found to be normally distributed, resulting in a parametric analysis for the upper tolerance limit. A parametric analysis consists of combining the mean, the standard deviation, and a constant which is based on the number of samples. These values are related in the following equation:

Upper tolerance limit = mean + (standard deviation x constant)

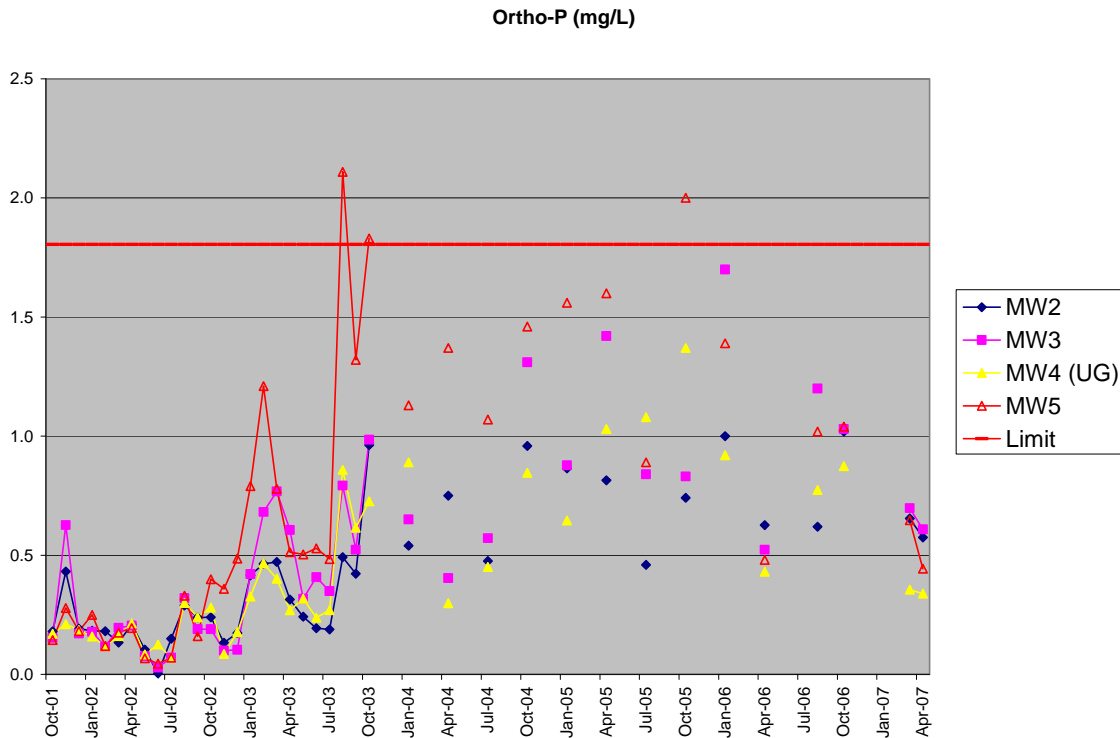
Due to the number of samples used in the calculation and the fact that the data were found to be normally distributed, the upper tolerance limit represents the calculated value from the background monitoring well data that statistically is expected to cover 95% of future measurements with 95% confidence.

The parameters temperature and NO₃-N were statistically examined, tested, and did not have a normal distribution so a nonparametric analysis is required. According to the *Implementation Guidance*, a nonparametric upper tolerance analysis defaults to the highest value in the dataset as the permit limit. For the nonparametric calculation, the sample size is significant. Since 40 samples were used in the analysis, the nonparametric permit limits thus obtained represent an upper tolerance limit with 87% confidence and 95% coverage. Data collected in MW4 during this permit will be used to update and recalculate ground water permit limits for next permit. The increase in the number of samples will result in more robust upper tolerance limit calculations.

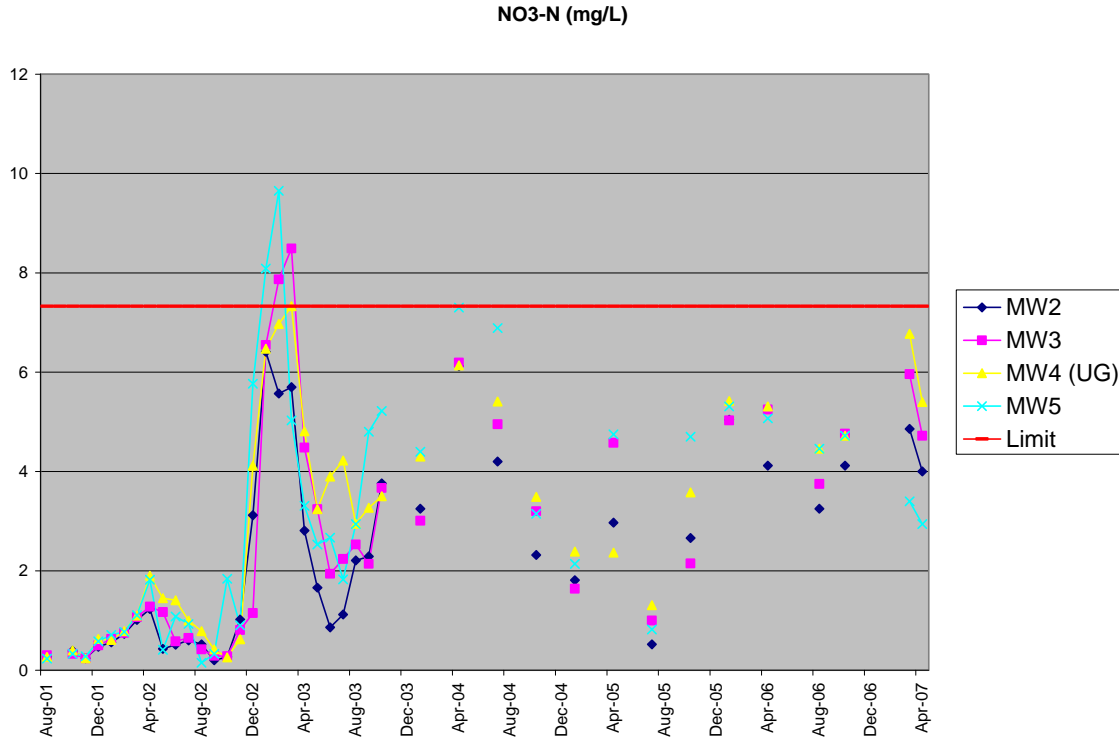
An exceedance of a permit limit is defined as two successive analyses above a limit in the 3 compliance monitoring wells, MW 2, 3, or 5. In the event of an exceedance, the permit will require the Permittee to notify Ecology and resample the well. Ecology may require the Permittee to prepare a report that documents the exceedance and discusses the steps necessary to achieve compliance. Inspection of the historical data in the following time series plots shows that the facility will be able to remain in compliance with the permit limits established for temperature, ortho-P, nitrate-N, and chloride.



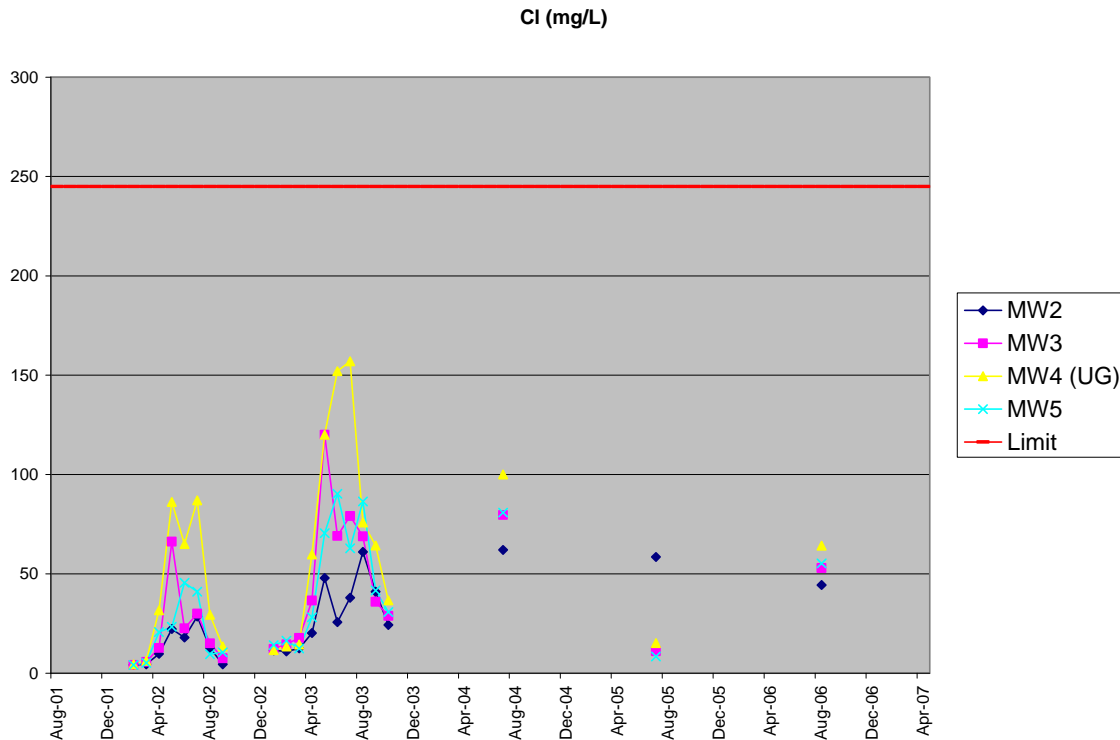
The time series plot of temperature compares the three compliance wells, the upgradient well, and the ambient river temperature to the calculated permit limit. The plot shows that there is a strong seasonal influence in the data. There is also a slight but general increase in ground water temperatures from synoptic measurements from the upgradient well across the site through the compliance wells to the river. However, the temperatures in ground water do not exceed the permit limit of 19.6°C. As expected, ground water temperatures typically do not reach the temperature extremes of surface water. That is, ground water is generally cooler than river water during the hottest months of the year and warmer than river water during the coldest months. The strong seasonality in the temperature data reinforces the assumption of hydraulic continuity and suggests that impacts from discharges to the drainfield may be masked by river temperatures. The permit adjusts the prior monitoring schedule by requiring more detailed monitoring during the summer months and expands the ground water and river monitoring sites and adjusts the monitoring frequency to obtain data during this important time period.



The next time series plot compares ortho-P concentrations among the wells and to the permit limit of 1.77 mg/L. All wells show an increase in ortho-P concentrations from the baseline data through early 2006. MW5 contains the highest ortho-P concentrations. It is located slightly upgradient of the infiltration pipe (Figure 1) but in close enough proximity to the pipe that mounding is likely affecting the water quality in this well. There were no exceedances of the permit limit in the historical measurements, although a few individual measurements in MW5 have been higher than the limit. There has been a substantial decline in the concentrations over the past year at all wells so that compliance with the permit limit in future measurements is not considered a problem.



The time series plot for NO3-N is similar to the ortho-P plot. Early in the operational life of the infiltration gallery, nitrate concentrations in MW3 and MW5 exceeded the permit limit of 7.33 mg/L in this permit and were substantially higher than baseline concentrations. Subsequent measurements are less than the permit limit. The first few years of monitoring exhibited seasonality, but more recent monitoring results have leveled off, and seasonality is not present.



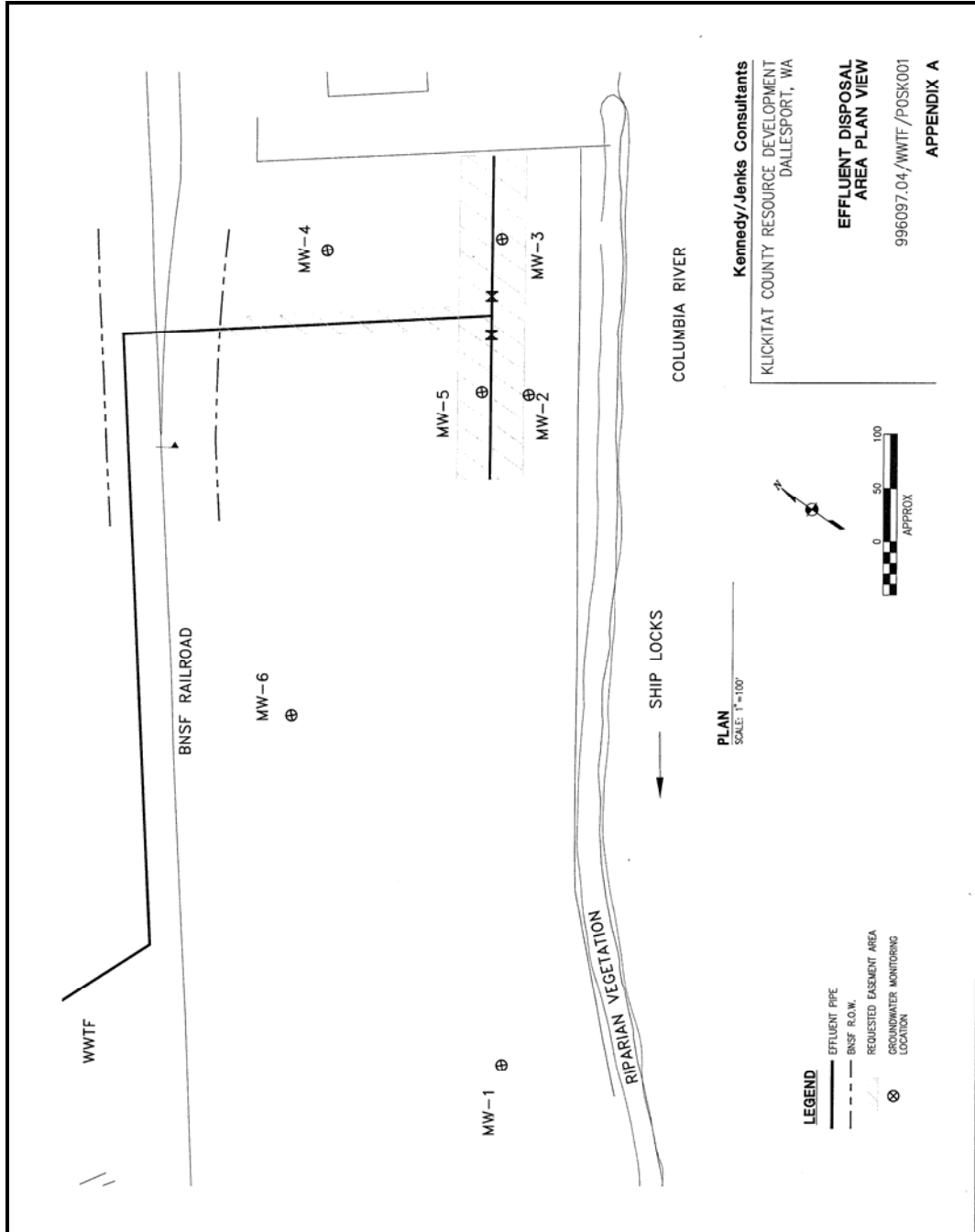
The final time series plot is data for chloride. The calculated permit limit is 245 mg/L. Chloride concentrations were obtained intermittently during the previous permit. The data were adequate to calculate a permit limit. The plot shows that the Permittee should remain in compliance with the permit limit. It is apparent that seasonality is present in the early data, with highest concentrations in the Spring and lowest concentrations in the Winter. It is significant that the highest ground water concentrations are recorded in the upgradient well, MW4. This suggests an upgradient source for chloride, or that river dilution affects the downgradient wells. Data for chloride are not available in the river, but are not expected to approach the concentrations found in the monitoring wells.

The monitoring well data was entered into the statistical program Sanitas, and examined using the procedures contained in the *Implementation Guidance for the Ground Water Standards* (Ecology Publication 96-02, April 1996). Calculations made following the *Implementation Guidance* result in an upper tolerance limit, which represents the permit limit in ground water. The table below shows the results of the Sanitas calculations.

Sanitas Calculations -- Intra-Well Tolerance Limit Summary					
Constituent	Well	Limit	BgN	Bg Mean	Std. Dev.
Temp (°C)	MW4	19.6	40	n/a	n/a
O-Phos (mg/L)	MW4	1.765	40	-1.116	0.7922
NO3 (mg/L)	MW4	7.33	40	n/a	n/a
Chloride (mg/L)	MW4	244.5	21	3.539	1.145
Constituent	%NDs	ND Adj.	Transform	Alpha	Method
Temp (°C)	0	n/a	Failed	0.1285	NP (normality)
O-Phos (mg/L)	2.5	No	Ln(x)	0.05	Param.
NO3 (mg/L)	0	n/a	Failed	1.1285	NP (normality)
Chloride (mg/L)	0	n/a	Cube root (x)	0.05	Param.

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The plan view below presents the effluent disposal site with details of the piping and monitoring well locations, relative to the Columbia River.



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**APPENDIX D -- WASTEWATER TREATMENT FACILITY CLASSIFICATION
 WORKSHEET**

Purveyor : City of _
 Address : PO Box _
 1

Facility Name : __
 Address : __
 __

County : __ Phone: __

Ownership of Plant: [X] Public [] Private

Facility --- Class	I	II	III	IV
Range of Points	25 and less	26-50	51-70	71 and greater

<u>ITEM</u>	<u>POINTS</u>	<u>POINTS ASSIGNED</u>
Size		
Design Flow	1 point per 5 mgd - maximum 20 points	1
Population Equivalent (PE).....	1 point per 5000 PE - maximum 20 points	1
Pretreatment Units		
Manually cleaned screens	1	1
Mechanically cleaned screens.....	2	0
Grit removal	3	3
Pre-aeration	1	0
Comminutor, barminutors, grinders, etc.....	1	1
Plant pumping	3	0
Separate industrial waste pretreatment	10	0
Primary Treatment Units		
Imhoff tank, spirogesters, clarigesters, etc.	3	0
Primary clarifiers.....	5	0
Primary clarifiers utilizing settling aid chemicals	9	0
Secondary Treatment Units		
Trickling filter (without recirculation).....	5	0
Trickling filter (with recirculation) or 2-stage RBC unit	7	0
3-stage RBC unit	9	0
Activated sludge		
Mechanical aeration.....	8	0
Diffused or dispersed air (or an SBR)	10	0
Oxidation ditch.....	8	8
Pure oxygen	13	0
Stabilization ponds	5	0
Stabilization ponds with aeration.....	7	0
Secondary clarifiers (or an SBR)	5	5
Tertiary Treatment Units		
Polishing pond.....	2	0
Land disposal of effluent, or post-aeration	5	0
Chemical treatment for phosphorus removal.....	5	0
Activated carbon beds (with carbon regeneration).....	10	0
Activated carbon beds (without carbon regeneration).....	8	0
Sand or mixed-media filters.....	4	0
Other nutrient removal processes following secondary treatment	10	0
Disinfection	4	4
Sludge Treatment		
Anaerobic digesters.....	4	0
If heated, add.....	3	0
If mechanically or gas mixed, add.....	2	0
Aerobic digesters.....	6	6
Drying beds or evaporation lagoons	2	2
Thickener clarifier, or polymer addition.....	5	0
Vacuum filter, or centrifuge.....	7	0
Land application, or supernatant lagoons	5	5
Incinerator	10	0
Utilizing digester gas for other than heating purposes	3	0
TOTAL		37
CLASS		II

APPENDIX E--RESPONSE TO COMMENTS

Ecology received the following comments from Mr. Doug Miller, Klickitat PUD WWW Project Manager:

“Can you better explain the numerical limit for the phosphate and nitrate? It seems it is because of some number that was there before. Why not some number a bit higher? What is driving the limits? Are we going to be facing these type of limits in the future at our other plants?”

Ecology's response:

The Klickitat PUD wastewater treatment facilities will not have nutrient limits in the near future. These facilities have NPDES permits and Washington State does not currently have surface water criteria for nitrates or phosphate. Should a water cleanup study for nutrients be conducted in the future, wasteload allocations could be assigned to direct dischargers.

Ecology is issuing a State wastewater discharge permit for the Dallesport STP.

There are two primary explanations for Dallesport's nitrate and phosphorus limits. First, the State ground water quality standards include a nitrate criterion. This limit is implemented so that the discharge does not cause the background (existing) concentration of nitrate to increase.

The rationale for the phosphorus limit is a bit more complicated. Dallesport discharges near the Columbia River. The EPA would prefer that this type of facility be under the jurisdiction of a NPDES permit. To show why it shouldn't be a NPDES permit, Dallesport needs to show that it is not degrading water quality near the river.

This is explained in the draft fact sheet when it cites the U.S. District Court Eastern District ruling in the following paragraph on page 10:

Ecology must decide if the discharge of pollutants into the ground near a surface water is subject to an National Pollutant Discharge Elimination System (NPDES) permit or State Waste discharge permit. Ecology believes the best guidance on this issue comes from the United States District Court Eastern District of Washington (Washington Wilderness Coalition v. Hecla Mining, 870 F. Supp 983, 990). The court held that “since the goal of the Clean Water Act (CWA) is to protect the quality of surface waters, any pollutant which enters such waters, whether directly or through groundwater, is subject to regulation by NPDES permit.” The court went on to hold, “[I]t is not sufficient to allege groundwater pollution, and then to assert a general hydrological connection between all

waters. Rather, pollutants must be traced from their source to surface waters, in order to come within the purview of the CWA.”

The actual numeric values for the permit limits were derived statistically from ground water monitoring conducted at Dallesport for the past four or more years. The permit limits are set based on data reported on DMRs submitted to date. From the fact sheet’s page 25:

Due to the number of samples used in the calculation and the fact that the data were found to be normally distributed, the upper tolerance limit represents the calculated value from the background monitoring well data that statistically is expected to cover 95% of future measurements with 95% confidence.

Doug Miller followed up with the following comment:

“Sounds like an NPDES would be a cheaper permit to operate, and easier to maintain.”

Ecology’s response:

If this facility had an NPDES permit with the existing subsurface discharge, no mixing zone would be allowed. All the specified surface water criteria such as temperature, pH, and dissolved oxygen would have to be met at the end of pipe. To meet these discharge standards, the facility would need additional treatment equipment. Another alternative for a NPDES permit would be to have a traditional outfall pipe discharging directly to the Columbia River. This would entail obtaining the proper permits from the U.S. Corp of Engineers which controls this section of the river. The facility may have to conduct a Tier II Antidegradation Analysis. This is a provision of the newly enacted Water Quality Standards for Surface Waters of the State of Washington (WAC 173-201A-320).