

**FACT SHEET FOR NPDES PERMIT WA0022683
CASTLE ROCK WASTEWATER TREATMENT PLANT**

SUMMARY

The Castle Rock Plant serves a small community and discharges to the Cowlitz River. The plant underwent a complete upgrade in 2003. The treatment process uses activated sludge where aeration is accomplished in an Orbal oxidation ditch. Effluent is sent to secondary clarifiers and disinfected with UV light. The discharge has excellent dilution and there are no recommendations in this fact sheet for water quality based limits.

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BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

HISTORY

The City was incorporated in 1890. At sometime in the early part of the 20th century, the City installed a combined sewer collection system. The City built its first sewage treatment system in 1954 using trickling filters. The facility upgraded the treatment system in 1977 and again in 2003. This 2003 upgrade completely revamped the treatment system. The trickling filters were replaced with an Orbal oxidation ditch. The headworks were revamped with new screening, grit classification and flow monitoring. The clarifiers were replaced and the solids processing has been upgraded. The pumps have been upgraded and a new backup power supply was added. In short, only a couple of tanks and some of the buildings remain from the original trickling filter. The facility now disinfects with Ultra Violet (UV) light.

COLLECTION SYSTEM STATUS

The City has approximately 57,900 feet of collection pipe and there is approximately 5,700 feet of collection pipe in the County. Approximately 43,000 feet of sewer collection system were installed in 1954 with the first treatment system. This older collection pipe was concrete with asphalt and oakum packed seals. The City video inspected, cleaned, and replaced portions of the main lines in 1977 and reevaluated the collection system again as part of the 2003 facility plan.

In the 2003 evaluation, approximately 46,600 feet of line were inspected out of 63,700 feet of line. The facility plan recommends that major sections of the main lines and laterals be replaced.

The 2003 facility plan notes that many areas of the city had lines and manholes replaced. There were approximately 3,016 feet of 6-inch to 21-inch pipe replaced and 13 manholes replaced or refurbished out of 28,000 feet of pipe and 138 manholes that need replacing. Many other areas of the collection system still need repairs to address Infiltration and Inflow (I&I) problems. Many areas have been identified in the facility plan for repairs, some of which are being done now and many of which will not be completed until ten or more years from now.

No other reports of line replacement have been noted in the I&I reports. Work on the collection system should be listed in future I&I reports.

There are two (2) lift stations owned and operated by the City and there is one lift station on the west side of the Cowlitz River owned and operated by Cowlitz County. There are also two (2) lift stations serving STEP systems, owned and operated, by WSDOT for two interstate-5 rest areas.

The collection system is partially controlled by the City, the County, and WSDOT. The County and WSDOT will therefore need to be included under the permit and named on the cover of the permit as a contributor to the treatment plant.

An interlocal agreement between the City and the County defined the responsibilities in building and running the facility and the collection system in each jurisdiction. The interlocal agreement is dated December 22, 1999. In addition, there is a combined water and sewer utility ordinance which includes unlawful connections and substances prohibited in the system.

The new system has room to grow and the facility should not have capacity issues through the next five (5) year permit cycle.

TREATMENT PROCESSES

The head works has a cyclonic grit chamber and grit classifier. Influent sampling is located after the grit chamber. A Parshall flume is used for flow monitoring. The screening is accomplished with a helical-screw fine screen.

The facility uses an Orbal oxidation ditch for aeration. The ditch receives activated sludge from secondary clarifiers and uses UV disinfection prior to discharge to the Cowlitz River. The Orbal oxidation ditch differs from a conventional oxidation ditch. The Orbal system has a second ditch outside of the normal single ditch separated by a single concrete wall. This set up with two ditches, inner and outer, allows activated sludge or influent to be entered into either ditch. This and other Orbal systems are able to sustain the biota during storm events by operating in contact stabilization mode. The system can also operate in conventional plug flow with very long detention times or step feed which reduces the functional size of the aeration basin. The mixing and aeration is accomplished with rotary aerators which can be run forward or backwards to achieve more or less aeration. At the time of this report, the mixers were set to run backwards and the system was in contact stabilization mode.

The flow from the oxidation ditch is split to two center-feed secondary clarifiers. The sludge from the clarifiers is pumped to either the oxidation ditch as return activated sludge or aerobic digesters. Sludge and biosolids processing is discussed under the residual solids section below.

The disinfection of the effluent is accomplished using UV light. The facility has two UV banks with 24 bulbs in each bank. The bulbs are self cleaning with mechanical wipers. The bulbs still need to be pulled once per month and soaked in an anti-scaling solution. The effluent flow is monitored with an ultrasonic sensor located in a stilling tube below finger weirs and there is a v-notch weir that is used for calibration.

The City and unincorporated County have little industry other than restaurants and the occasional auto shop.

The facility is classified as Group II, based on a design flow of 0.8 mgd for the maximum month and using the activated sludge process. The operator, therefore, in responsible charge of the plant and must be certified at the Group II level and the operator in charge of operating during the shift must be a Group I operator, see WAC 173-230-010 and WAC 173-230-140. There are four (4) part time operators. One operator has a group I certification, two (2) operators have group II certifications and one (1) operator is an OIT. The facility is operated for a full 8-hour shift for five (5) days a week and an operator visits the plant on the weekend days.

DISCHARGE OUTFALL

Secondary treated and disinfected effluent is discharged from the facility to the Cowlitz River. The start of the outfall is approximately 30 feet from the north shore and the river is approximately 147 feet wide at this point. The outfall is at a depth of 9.6 feet at the critical 7Q10 low flow. There are six (6) 4-inch diffuser ports that are 3-feet apart from the port centers. The ports are angled at 90° to face down stream with the river flow (Morrissette, 1995).

RESIDUAL SOLIDS

The sludge settled in the clarifiers is eventually wasted to an aerobic digester. Digested sludge is moved to a second digester for more aging and storage or can be thickened by a gravity belt thickener where polymer is added to aid thickening and returned to one of the tanks. The final digested and thickened solids are sent to a belt filter press and to drying beds and then land applied on City owned land composed of former dredge spoils adjacent to the Cowlitz River. The solids removed from the secondary clarifiers, require a biosolids permit administered by the Department of Ecology, Solid Waste Program, and are not covered under this permit.

PERMIT STATUS

The previous permit for this facility was originally issued on October 25, 1996, and then renewed again on October 2, 2001, without change. The permit was modified on February 9, 2006, to remove language for limits on chlorine after the installation of UV disinfection. The previous permit placed effluent limitations on 5-day Biochemical Oxygen Demand (BOD₅), Total Suspended Solids (TSS), pH, and Fecal Coliform bacteria.

An application for permit renewal was submitted to the Department on December 14, 2005, and accepted by the Department on January 6, 2006, from which compliance can be gauged.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

The facility received its last inspection on January 9, 2007. The facility was producing good effluent but the staffing levels at the plant for operation and maintenance were low.

Because the new facility has only been operating since January 20, 2005, there are only two (2) years of plant operations.

The facility has had four violations for pH excursions and 27 warnings for improper monitoring frequency of suspended solids and BOD. The pH does not appear to be a continual problem and very likely is related to meter calibration. The facility has otherwise remained in compliance. This evaluation is based on Discharge Monitoring Reports (DMRs) submitted to the Department and inspections conducted by the Department.

However, despite reporting violations, the effluent BOD has been very low. The average weekly BOD was 10 mg/L and the average percent BOD removed was 98 percent. The average weekly TSS was 12 mg/L and the average percent TSS removed was 96 percent.

SEPA COMPLIANCE

The City complied with State Environmental Policy Act (SEPA) and made a declaration of non-significance (DNS) for the upgrade and expansion of the waste water treatment works. The DNS was filed on April 14, 2003.

PROPOSED 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 for municipal discharges are set by regulation (40 CFR 133, and Chapters 173-220 and 173-221 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (40 CFR 131.36.) The most stringent of these types of 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. The Department 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. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

DESIGN CRITERIA

In accordance with WAC 173-220-150 (1)(g), flows or waste loadings shall not exceed approved design criteria.

The design criteria for this treatment facility are taken from the 2003 Facility Plan and the completed construction drawings (as-built engineering plans) prepared by Tetra Tech/KCM dated August 27, 2003. These design criteria are as follows:

Table 1: Design Standards for the Castle Rock WWTP.

Parameter	Design Quantity
Monthly average flow (max. month)	0.80 mgd
Monthly average dry weather flow	0.33 mgd
Peak day flow	2.25 mgd
Instantaneous peak flow (hour)	2.75 mgd
BOD ₅ influent loading	1,290 lb./day
TSS influent loading	980 lb./day
Design population equivalent	4,300

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Municipal wastewater treatment plants are a category of discharger for which technology-based effluent limits have been promulgated by federal and state regulations. These effluent limitations are given in the Code of Federal Regulations (CFR) 40 CFR Part 133 (federal) and in Chapter 173-221 WAC (state). These regulations are performance standards that constitute all known available and reasonable methods of prevention, control, and treatment for municipal wastewater.

The following technology-based limits for pH, fecal coliform, BOD₅, and TSS are taken from Chapter 173-221 WAC are:

Table 2: Technology-based Limits.

Parameter	Limit
pH:	shall be within the range of 6 to 9 standard units.
Fecal Coliform Bacteria	Monthly Geometric Mean = 200 organisms/100 ml Weekly Geometric Mean = 400 organisms/100 ml
BOD ₅ (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L
TSS (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L

The following technology-based mass limits are based on WAC 173-220-130(3)(b) and 173-221-030(11)(b).

BOD Mass Loading

Monthly effluent mass loadings (lbs/day) for BOD were calculated as the maximum monthly influent design loading (1290 lbs/day) x 0.15 = 194 lbs/day.

The weekly average effluent mass loading for BOD is calculated as 1.5 x monthly loading = 291 lbs/day.

TSS Mass Loading

Monthly effluent mass loadings (lbs/day) for TSS were calculated as the maximum monthly influent design loading (980 lbs/day) x 0.15 = 147 lbs/day.

The weekly average effluent mass loading for TSS is calculated as 1.5 x monthly loading = 221 lbs/day.

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. 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).

There is no 303d listing to indicate impairment of the water of the Cowlitz River anywhere near the outfall. Therefore, there is no TMDL planned for the Cowlitz River.

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 state was issued 91 numeric water quality criteria for the protection of human health by the U.S. EPA (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish 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) and marine (WAC 173-201A-140) 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 receiving waters are of higher quality than the criteria assigned, the existing water quality 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; therefore, the Department will use the designated classification criteria for this water body in the proposed permit. The discharges authorized by this proposed permit should not cause a loss of beneficial uses.

CRITICAL CONDITIONS

Surface water quality-based limits are derived for the water body'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. The critical condition for the pollutants in this discharge is the seven day low flow with a 10 year occurrence (7Q10). This 7Q10 flow is 2920 cfs.

MIXING ZONES

This permit authorizes an acute and a chronic mixing zone around the point of discharge as allowed by Chapter 173-201A WAC, *Water Quality Standards for Surface Waters of the State of Washington*. The Water Quality Standards stipulate some criteria be met before a mixing zone is allowed. The requirements and the Department's actions are summarized as follows:

1. The allowable size and location be established in a permit.

For this discharge, the percent volume restrictions of the Water Quality Standards resulted in a lower dilution factor than the distance and width restrictions. Therefore, the dilution factor calculated at a 10 year low flow was used to determine reasonable potential to exceed water quality standards.

2. Fully apply “all known available and reasonable methods of treatment” (AKART).

The technology-based limitations determined to be AKART are discussed in an earlier Section of this fact sheet.

3. Consider critical discharge condition.

The critical discharge condition is often pollutant-specific or water body-specific and is discussed above.

4. Supporting information clearly indicates the mixing zone would not have a reasonable potential to cause the loss of sensitive or important habitat, substantially interfere with the existing or characteristic uses, result in damage to the ecosystem or adversely affect public health.

The Department has reviewed the information on the characteristics of the discharge, receiving water characteristics and the discharge location. Based on this information, the Department believes this discharge does not have a reasonable potential to cause the loss of sensitive or important habitat, substantially interfere with existing or characteristics uses, result in damage to the ecosystem or adversely affect public health.

5. Water quality criteria shall not be violated (exceeded) outside the boundary of a mixing zone.

A reasonable potential analysis, using procedures established by USEPA and the Department, was conducted for each pollutant to assure there will be no violations of the water quality criteria outside the boundary of a mixing zone.

6. The size of the mixing zone and the concentrations of the pollutants shall be minimized.

The size of the mixing zone (in the form of the dilution factor) has been minimized by the use of design criteria with low probability of occurrence. For example, the reasonable potential analysis used the expected 95th percentile pollutant concentration, the 90th percentile background concentration, the centerline dilution factor and the low flow occurring once in every 10 years. The concentrations of the pollutants in the mixing zone have been minimized by requiring pollution prevention measures where applicable.

7. Maximum size of mixing zone

The authorized mixing zone does not exceed the maximum size restriction.

8. Acute Mixing Zone

A. Acute criteria met as near to the point of discharge as practicably attainable

The acute criteria have been determined to be met at 10 percent of the distance of the chronic mixing zone.

B. The concentration of, and duration and frequency of exposure to the discharge, will not create a barrier to migration or translocation of indigenous organisms to a degree that has the potential to cause damage to the ecosystem.

The toxicity of pollutants is dependent upon the exposure which in turn is dependent upon the concentration and the time the organism is exposed to that concentration. For example EPA gives the acute criteria for copper as “freshwater aquatic organisms and their uses should not be affected unacceptably if the 1- hour average concentration (in µg/l) does not exceed the numerical value given by $(0.960)(e^{(0.9422[\ln(\text{hardness})] - 1.464)})$ more than once every three (3) years on the average.” The limited acute mixing zone authorized for this discharge will assure that it will not create a barrier to migration. The effluent from this discharge will rise as it enters the receiving water assuring that it will not cause translocation of indigenous organism near the point of discharge.

C. Comply with size restrictions

The mixing zone authorized for this discharge meets the size restrictions of WAC 173-201A.

9. Overlap of Mixing Zones

This mixing zone does not overlap another mixing zone

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

DESCRIPTION OF THE RECEIVING WATER

The facility discharges to the Cowlitz River which is designated as a Class A receiving water in the vicinity of the outfall. (The old standards used the classification system and the uses under the new standards are virtually the same as shown below.) There are no nearby point source outfalls. Significant nearby non-point sources of pollutants may include urban stormwater and inputs from upstream livestock and logging in the rural areas.

Aquatic life uses include the following: Non-core salmon and trout. Recreational uses include: primary contact recreation. Water uses include: domestic; industrial; and agricultural. Other uses include: wildlife habitat; harvesting; boating; commerce and navigation; and aesthetic enjoyment.

Water quality use designations for this water body shall meet or exceed the requirements for all or substantially all uses.

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). Criteria for this discharge are summarized below:

Fecal Coliform	100 organisms/100 ml maximum geometric mean
Dissolved Oxygen	8 mg/L minimum
Temperature (Noncore ¹)	17.5 degrees Celsius maximum or incremental increases above background.
pH	6.5 to 8.5 standard units
Turbidity	less than 5 NTUs above background when background is 50 NTU or less and less than 10 NTUs above background when background is 50 NTU or more
Toxics	No toxics in toxic amounts (see Appendix C for numeric criteria for toxics of concern for this discharge)

¹ This temperature supports salmon and trout spawning, noncore rearing, and migration.

CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

Pollutant concentrations in the proposed discharge exceed water quality criteria with technology-based controls which the Department has determined to be AKART. A mixing zone is authorized in accordance with the geometric configuration, flow restriction, and other restrictions for mixing zones in Chapter 173-201A WAC and are defined as follows:

The depth of water over the diffuser at the 7Q10 critical low flow is 9.6 feet. Therefore, the chronic mixing zone boundary must not exceed 310 feet down stream or 100 feet upstream. The acute mixing zone boundary must not exceed 31 feet down stream or 10 feet upstream.

The dilution factors of effluent to receiving water that occur within these zones have been determined at the critical condition by the use of Plumes and Visual Plumes. The dilution factors have been determined to be:

	Acute	Chronic
Aquatic Life	6	145

The above dilution factors were used in the 2001 permit. The original documentation and modeling of the above dilution factors is not available. However, new dilution modeling using Visual Plumes showed that the above factors are valid. Therefore, the old dilution factors were kept.

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 water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of 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 Cowlitz River is the 7-day average low river flow with a recurrence interval of 10 years (7Q10). Ambient data at critical conditions in the vicinity of the outfall was taken from the

USGS record for the Cowlitz River at the gaging station at the A-Street Bridge (USGS, 1984). Information was originally gathered in report on the installation of a new outfall diffuser and on dilution (Morrissette, 1995). Although the 7Q10 value in that report was originally lower, the report had other good values that were used to calculate and confirm the newer dilution factors. The ambient background data used for this permit includes the following data:

Parameter	Value used
7Q10 low flow ¹	2920 cfs
Velocity	2.54 ft/sec
Depth	9.6 feet
Width	147 feet
Roughness (Manning)	n=0.0283
Slope	0.000148 ft/ft
Temperature ²	17.14° C
pH (high) ³	7.6 S.U.
Dissolved Oxygen ⁴	10.4 mg/L
Total Ammonia-N ³	0.010 mg/L
Fecal Coliform ³	23.3/100 ml
Turbidity ³	20.4 NTU
Hardness ⁵	28 mg/L as CaCO ₃
Metals	No metals data, assumed below detection

¹ (USGS 1984, Pearson III statistic for 1970-1979 flows from after controlling structures were installed)

² (90th percentile, Cowlitz at Kelso Station. 26B70 June /2001-Sept/2004)

³ (90th percentile, Cowlitz at C.R. Station 26B100, Oct/2005-Sept/2006)

⁴ (10th percentile, Cowlitz at C.R. Station 26B100, Oct/2005-Sept/2006)

⁵ (10th percentile, Cowlitz at C.R. Station 26B100, 1967-1977)

The two sources of ambient data in the above table came from two (2) Department sampling stations nearest to the Castle Rock outfall. The first station, 26B100, is at the A-Street Bridge 4800 feet above the outfall. The second station is 26B70 which is approximately 10 miles downstream near Kelso. The 26B70 station had more extensive temperature data which was necessary to calculate a 90th percentile for the summer season. The data in the above table was all less than 10 years old, except for hardness which was not sampled in recent years. The low hardness values as shown in this older data can cause metals to be toxic at lower values.

BOD₅--This discharge with technology-based limitations results in a small amount of BOD loading relative to the large amount of dilution occurring in the receiving water at critical conditions. Technology-based limitations will be protective of dissolved oxygen criteria in the receiving water. The BOD was also examined with simple mixing and examining down stream DO which is excellent and is actually higher than the upstream DO.

Temperature and pH--The impact of pH and temperature were modeled using the calculations from EPA, 1988. The input variables were dilution factor 145, upstream temperature 19.18°C, upstream pH 7.6,

upstream alkalinity 18 (as mg CaCO₃/L), effluent temperature 22°C*, effluent pH of 6, effluent pH of 9, and effluent alkalinity 150 (as mg CaCO₃/L) (See Appendix C).

*No effluent temperature samples were available. Effluent temperature from nearby wastewater treatment plants ranges from 20°C to 22°C. Therefore 22°C was used to estimate the potential temperature increase.

The temperature increase calculated from this method was 0.02°C at the edge of the mixing zone. Although the ambient temperature is above the criterion, the change in temperature will not exceed the 0.3°C allowed under the water quality standard. Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, the technology-based effluent limitation for pH was placed in the permit and temperature was not limited.

Fecal coliform--The numbers of fecal coliform were modeled by simple mixing analysis using the technology-based limit of 400 organisms per 100 ml and a dilution factor of 145. With a background 90th percentile fecal coliform of 23 org/100 ml, the fecal coliform would increase by no more than 3 org/100 ml. The effluent fecal coliform from this facility using UV disinfection is typically averages less than 8 org/100 ml.

Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters with the technology-based limit. Therefore, the technology-based effluent limitation for fecal coliform bacteria was placed in the proposed permit.

Toxic Pollutants--Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality-based effluent limits.

Ammonia is the only toxic known to be present in the wastewater. Metals in small amounts may also be present; however, no testing has been conducted for ammonia or metals. A reasonable potential analysis (See Appendix C) for ammonia assuming an effluent value of 30 mg/L (a high value for this type of plant) was conducted on these parameters to determine whether or not effluent limitations would be required in this permit.

The determination of the reasonable potential for ammonia to exceed the water quality criteria was evaluated with procedures given in EPA, 1991 (Appendix C) at the critical condition. The critical condition in this case occurs summer warm dry months. No reasonable potential was found for ammonia. No metals data is available at this time. Metals in toxic amounts are not expected from this discharge with no industry and excellent dilution.

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.

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, and does not contain chemicals of concern based on existing data or knowledge. The discharge will be re-evaluated for impacts to human health at the next permit reissuance.

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 discharger characteristics 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 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 and therefore no limitations are required based on potential effects to ground water.

COMPARISON OF EFFLUENT LIMITS WITH THE EXISTING PERMIT ISSUED 2001

The table below shows the effluent limits that were in the 2001 permit and compares these values with the limits that are proposed for the new permit.

Parameter	Existing Limits		Proposed Limits	
	Average Monthly	Average Weekly	Average Monthly	Average Weekly
BOD₅	30 mg/L 173 lbs/day	45 mg/L 260 lbs/day	30 mg/L 194 lbs/day	45 mg/L 291 lbs/day
TSS	30 mg/L 173 lbs/day	45 mg/L 260 lbs/day	30 mg/L 147 lbs/day	45 mg/L 221 lbs/day
Fecal Coliform Bacteria	200/100 ml	400/100 ml	200/100 ml	400/100 ml
pH	Shall not be outside the range of 6.0 to 9.0 S.U.		Shall not be outside the range of 6.0 to 9.0 S.U.	
	Average Monthly	Average Daily	Average Monthly	Average Daily
Total Chlorine	54 µg/L	114 µg/L	No chlorine limits are needed in this permit with UV disinfection	

The only changes from the existing permit will be the loading limits and the removal of the chlorine limits. The new plant has more capacity and therefore the loading limits in pounds per day have increased.

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 sludge quantity and quality is necessary to determine the appropriate uses of the sludge. Sludge monitoring is required by the current state and local solid waste management program and also by EPA under 40 CFR 503.

The monitoring schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of the Department's *Permit Writer's Manual* (July 1994) for an oxidation ditch using activated sludge of this size.

Additional monitoring is required in order to further characterize the effluent. These monitored pollutants could have a significant impact on the quality of the surface water.

LAB ACCREDITATION

With the exception of certain parameters 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*. The laboratory at the facility is accredited for general chemistry which includes BOD/CBOD, DO, pH, TSS; and microbiology which includes fecal coliform. The laboratory is accredited until August 2007.

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

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

PREVENTION OF FACILITY OVERLOADING

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the Permittee to take the actions detailed in proposed permit requirement S.4. to plan expansions or modifications before existing capacity is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Condition S.4 restricts the amount of flow.

OPERATION AND MAINTENANCE (O&M)

The proposed permit contains condition S.5 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.

Inflow and infiltration (I&I) has been documented in several portions of the City's collection system and need to be further characterized.

Significant portions of the collection system are nearly 60 years old, were constructed using techniques such as concrete pipes with oakum packing and/or have numerous manholes which were not installed using modern materials. Leaks are anticipated to be present in significant quantities or in sensitive locations. The permit will require continued vigilance to move forward to areas identified in the facility plan as needing replacement. Progress must be documented and listed in the annual I&I report as required in the new permit.

In the future, new characterization of the size and location of leaks may be required if no progress is made in fixing the old leaks or new leaks suspected. Three good references to aid in these tasks are: 1) American Society of Civil Engineers and Water Environment Federation Manual of Practice FD-6. Existing Sewer Evaluation and Rehabilitation, 2) U.S. Environmental Protection Agency. Handbook for Sewer System Infrastructure Analysis and Rehabilitation. EPA/625/6-91/030. 1991, and 3) Washington State Department of Transportation. Standard Specifications for Road, Bridge, and Municipal Construction. 2002.

Due to the age and construction methods employed during installation of the collection system, leaks are expected to be present.

RESIDUAL SOLIDS HANDLING

To prevent water quality problems the Permittee is required in permit condition S7 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 the Department under Chapter 70.95J RCW, Chapter 173-308 WAC "Biosolids Management," and Chapter 173-350 WAC "Solid Waste Handling Standards." The disposal of other solid waste is under the jurisdiction of the Cowlitz County Health Department.

Requirements for monitoring sewage sludge and recordkeeping are included in this permit. This information will be used by the Department to develop or update local limits and is required under 40 CFR 503.

PRETREATMENT

FEDERAL AND STATE PRETREATMENT PROGRAM REQUIREMENTS

Under the terms of the addendum to the "Memorandum of Understanding between Washington Department of Ecology and the United States Environmental Protection Agency, Region 10" (1986), the Department has been delegated authority to administer the Pretreatment Program [i.e. act as the Approval Authority for oversight of delegated Publicly Owned Treatment Works (POTWs)]. Under this delegation of authority, the Department has exercised the option of issuing wastewater discharge permits for significant industrial users discharging to POTWs which have not been delegated authority to issue wastewater discharge permits.

There are a number of functions required by the Pretreatment Program which the Department is delegating to such POTWs because they are in a better position to implement the requirements (e.g. tracking the number and general nature of industrial dischargers to the sewerage system). The requirements for a Pretreatment Program are contained in Title 40, part 403 of the Code of Federal Regulations. Under the requirements of the Pretreatment Program [40 CFR 403.8(f)(1)(iii)], the

Department is required to approve, condition, or deny new discharges or a significant increase in the discharge for existing significant industrial users (SIUs) [40 CFR 403.8 (f)(1)(i)].

The Department is responsible for issuing State Waste Discharge Permits to SIUs and other industrial users of the Permittee's sewer system. Industrial dischargers must obtain these permits from the Department prior to the Permittee accepting the discharge [WAC 173-216-110(5)] (Industries discharging wastewater that is similar in character to domestic wastewater are not required to obtain a permit. Such dischargers should contact the Department to determine if a permit is required.). Industrial dischargers need to apply for a State Waste Discharge Permit 60 days prior to commencing discharge. The conditions contained in the permits will include any applicable conditions for categorical discharges, loading limitations included in contracts with the POTW, and other conditions necessary to assure compliance with State water quality standards and biosolids standards.

The Department requires this POTW to fulfill some of the functions required for the Pretreatment Program in the NPDES permit (e.g. tracking the number and general nature of industrial dischargers to the sewage system). The POTW's NPDES permit will require that all SIUs currently discharging to the POTW be identified and notified of the requirement to apply for a wastewater discharge permit from the Department. None of the obligations imposed on the POTW relieve an industrial or commercial discharger of its primary responsibility for obtaining a wastewater discharge permit (if required), including submittal of engineering reports prior to construction or modification of facilities [40 CFR 403.12(j) and WAC 173-216-070 and WAC 173-240-110, et seq.].

WASTEWATER PERMIT REQUIRED

RCW 90.48 and WAC 173-216-040 require SIUs to obtain a permit prior to discharge of industrial waste to the Permittee's sewerage system. This provision prohibits the POTW from accepting industrial wastewater from any such dischargers without authorization from the Department.

REQUIREMENTS FOR ROUTINE IDENTIFICATION AND REPORTING OF INDUSTRIAL USERS

The NPDES permit requires non-delegated POTWs to "take continuous, routine measures to identify all existing, new, and proposed SIUs and potential significant industrial users (PSIUs) discharging to the Permittee's sewerage system." Examples of such routine measures include regular review of business tax licenses for existing businesses and review of water billing records and existing connection authorization records. System maintenance personnel can also be diligent during performance of their jobs in identifying and reporting as-yet unidentified industrial dischargers. Local newspapers, telephone directories, and word-of-mouth can also be important sources of information regarding new or existing discharges. The POTW is required to notify an industrial discharger, in writing, of their responsibilities regarding application for a State Waste Discharge Permit and to send a copy of the written notification to the Department. The Department will then take steps to solicit a State waste discharge permit application.

ANNUAL SUBMITTAL OF LIST OF INDUSTRIAL USERS

This provision requires the POTW to submit annually a list of existing and proposed SIUs and PSIUs. This requirement is intended to update the Department on an annual basis of the status of industrial users in the POTW's service area, without requiring the POTW to go through the process of performing a formal Industrial User Survey. This provision is normally applied to POTWs not serving industrial or commercial users. Although this permit does not require performance of an Industrial User Survey, the Permittee is nevertheless required under the previous section, to take adequate continuous routine measures to identify existing and new industrial discharges.

DUTY TO ENFORCE DISCHARGE PROHIBITIONS

This provision prohibits the POTW from authorizing or permitting an industrial discharger to discharge certain types of waste into the sanitary sewer. The first portion of the provision prohibits acceptance of pollutants which cause pass through or interference. The definitions of pass through and interference are in Appendix B of the fact sheet.

The second portion of this provision prohibits the POTW from accepting certain specific types of wastes, namely those which are explosive, flammable, excessively acidic, basic, otherwise corrosive, or obstructive to the system. In addition, wastes with excessive BOD, petroleum based oils, or which results in toxic gases are prohibited to be discharged. The regulatory basis for these prohibitions is 40 CFR Part 403, with the exception of the pH provisions which are based on WAC 173-216-060.

The third portion of this provision prohibits certain types of discharges unless the POTW receives prior authorization from the Department. The discharges include cooling water in significant volumes, stormwater and other direct inflow sources, and wastewaters significantly affecting system hydraulic loading, which do not require treatment.

SUPPORT BY THE DEPARTMENT FOR DEVELOPING PARTIAL PRETREATMENT PROGRAM BY POTW

The Department has committed to providing technical and legal assistance to the Permittee in fulfilling these joint obligations, in particular, assistance with developing an adequate sewer use ordinance, notification procedures, enforcement guidelines, and developing local limits and inspection procedures.

OUTFALL EVALUATION

Proposed permit condition S.9 requires the Permittee to conduct an outfall inspection and submit a report detailing the findings of that inspection. The purpose of the inspection is to determine the condition of the discharge pipe and diffusers and to determine if sediment is accumulating in the vicinity of the outfall.

GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual municipal 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, Sediment Quality Standards, or Ground Water Standards, 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 protect human health, aquatic life, and the beneficial uses of waters of the state of Washington. The Department proposes that this permit be issued for five 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.

Morrisette, Jerome W.

1995. City of Castle Rock, Wastewater Treatment Plant Outfall Diffuser Repair. Engineering Report. JWM&A, Jerome W. Morrisette and Associates Inc. P.S. #94142COR. Olympia WA.

Metcalf and Eddy.

1991. Wastewater Engineering, Treatment, Disposal, and Reuse. Third Edition.

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

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

USGS

1984. Streamflow Statistics and Drainage-Basin Characteristics for the Southwestern and Eastern Regions, Washington. Volume I. Southwestern Washington. Open-File Report 84-145-A

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.

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

Water Pollution Control Federation.

1976. Chlorination of Wastewater.

Wright, R.M., and A.J. McDonnell.

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(E2). (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.

Public notice of application was published on June 19, 2006, and June 26, 2006, in the *Longview Daily News* to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department will publish a Public Notice of Draft (PNOD) on August 28, 2007, in the *Longview Daily News* to inform the public that a draft permit and fact sheet is 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
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

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 the 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 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 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 at (360) 407-6554, or by writing to the address listed above.

This permit and fact sheet were written by Eric Schlorff.

APPENDIX B--GLOSSARY

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

AKART-- An acronym for "all known, available, and reasonable methods of prevention, control, and 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 highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month (except in the case of fecal coliform). The daily discharge is calculated as the average measurement of the pollutant over the day.

Average Weekly Discharge Limitation -- The highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week. The daily discharge is calculated as the average measurement of the pollutant over the day.

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 a treatment facility.

CBOD₅ – The quantity of oxygen utilized by a mixed population of microorganisms acting on the nutrients in the sample in an aerobic oxidation for five days at a controlled temperature of 20 degrees Celsius, with an inhibitory agent added to prevent the oxidation of nitrogen compounds. The method for determining CBOD₅ is given in 40 CFR Part 136.

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 pollutant 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.

Combined Sewer Overflow (CSO)--The event during which excess combined sewage flow caused by inflow is discharged from a combined sewer, rather than conveyed to the sewage treatment plant because either the capacity of the treatment plant or the combined sewer is exceeded.

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 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 a minimum of four 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 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 a short period of time as is feasible.

Industrial User-- A discharger of wastewater to the sanitary sewer which is not sanitary wastewater or is not equivalent to sanitary wastewater in character.

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.

Infiltration and Inflow (I/I)--"Infiltration" means the addition of ground water into a sewer through joints, the sewer pipe material, cracks, and other defects. "Inflow" means the addition of precipitation-caused drainage from roof drains, yard drains, basement drains, street catch basins, etc., into a sewer.

Interference -- A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal and;

Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to subtitle D of the SWDA), sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

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--A volume 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.

Pass through -- A discharge which exits the POTW into waters of the--State in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of State water quality standards.

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.

Potential Significant Industrial User--A potential significant industrial user is defined as an Industrial User which does not meet the criteria for a Significant Industrial User, but which discharges wastewater meeting one or more of the following criteria:

- a. Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day or;
- b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).

The Department may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

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

Significant Industrial User (SIU)--

- 1) All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N and;
- 2) Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

*The term "Control Authority" refers to the Washington State Department of Ecology in the case of non-delegated POTWs or to the POTW in the case of delegated POTWs.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, wetlands, 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 are the particulate materials 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 or mass 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

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/programs/wq/wastewater/index.html>

Calculation of pH of a mixture of two flows. Based on the procedure in EPA's DESCONE 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	145.000
1. UPSTREAM/BACKGROUND CHARACTERISTICS	
Temperature (deg C):	19.18
pH:	7.60
Alkalinity (mg CaCO3/L):	18.00
2. EFFLUENT CHARACTERISTICS	
Temperature (deg C):	22.00
pH:	7.40
Alkalinity (mg CaCO3/L):	150.00
OUTPUT	
1. IONIZATION CONSTANTS	
Upstream/Background pKa:	6.39
Effluent pKa:	6.37
2. IONIZATION FRACTIONS	
Upstream/Background Ionization Fraction:	0.94
Effluent Ionization Fraction:	0.91
3. TOTAL INORGANIC CARBON	
Upstream/Background Total Inorganic Carbon (mg CaCO3/L):	19.10
Effluent Total Inorganic Carbon (mg CaCO3/L):	163.95
4. CONDITIONS AT MIXING ZONE BOUNDARY	
Temperature (deg C):	19.20
Alkalinity (mg CaCO3/L):	18.91
Total Inorganic Carbon (mg CaCO3/L):	20.10
pKa:	6.39
pH at Mixing Zone Boundary:	7.59

Fact Sheet for NPDES Permit No. WA0022683
 Castle Rock Wastewater Treatment Plant

Calculation Of Ammonia Concentration and Criteria for fresh water. Based on EPA Quality Criteria for Water (EPA 400/5-86-001) and WAC 173-201A. Revised 1-5-94 (corrected total ammonia criterion). Revised 3/10/95 to calculate chronic criteria in accordance with EPA Memorandum from Heber to WQ Stds Coordinators dated July 30, 1992.

INPUT

- 1. Ambient Temperature (deg C; 0<T<30) 19.2
- 2. Ambient pH (6.5<pH<9.0) 7.60
- 3. Acute TCAP (Salmonids present- 20; absent- 25) 20
- 4. Chronic TCAP (Salmonids present- 15; absent- 20) 15

OUTPUT

- 1. Intermediate Calculations:
 - Acute FT 1.06
 - Chronic FT 1.41
 - FPH 1.30
 - RATIO 16
 - pKa 9.43
 - Fraction Of Total Ammonia Present As Un-ionized 1.4673%
- 2. Un-ionized Ammonia Criteria
 - Acute (1-hour) Un-ionized Ammonia Criterion (ug NH3/L) 188.3
 - Chronic (4-day) Un-ionized Ammonia Criterion (ug NH3/L) 27.8
- 3. Total Ammonia Criteria:
 - Acute Total Ammonia Criterion (mg NH3+ NH4/L) 12.8
 - Chronic Total Ammonia Criterion (mg NH3+ NH4/L) 1.9
- 4. Total Ammonia Criteria expressed as Nitrogen:
 - Acute Ammonia Criterion as mg N 10.5
 - Chronic Ammonia Criterion as N 1.56

Reasonable Potential Calculation for Ammonia.

This spreadsheet calculates the reasonable potential to exceed state water quality standards for a small number of samples. The procedure and calculations are done per the procedure in Technical Support Document for Water Quality-based Toxics Control, U.S. EPA, March, 1991 (EPA/505/2-90-001) on page 56. User input columns are shown with red headings. Corrected formulas in col G and H on 5/98 (GB)										CALCULATIONS							
Parameter	Metal Criteria Translator as decimal	Metal Criteria Translator as decimal	Ambient Concentration (metals as dissolved) ug/L	State Water Quality Standard		Max concentration at edge of...		LIMIT REQ'D?	Effluent percentile value	Pn	Max effluent conc. measured (metals as total recoverable) ug/L	Coeff Variation CV	s	# of samples n	Multiplier	Acute Di'n Factor	Chronic Di'n Factor
				Acute ug/L	Chronic ug/L	Acute Mixing Zone ug/L	Chronic Mixing Zone ug/L										
Ammonia	1.00	1.00	10.0	10500.0	1560.0	70.32	12.50	NO	0.95	0.050	60.00	0.60	0.55	1	6.20	6	145

APPENDIX D--RESPONSE TO COMMENTS

The following comment was from Cowlitz County Department of Public Works, Utilities Division, which was received on September 26, 2007:

Comment 1:

The draft NPDES permit identifies certain responsibilities that would fall to Cowlitz County due to a portion of the collection system being under its ownership and control. Of primary concern to the County are the dates for completion associated with the Infiltration and Inflow (I&I) and Exfiltration studies required under Section S4(E). Due to staff time and budgetary restraints, Cowlitz County requests that these initial deadlines be extended to February 15, 2010, and February 15, 2012, respectively. Cowlitz County also believes that requiring subsequent I&I reports on an annual basis is excessive and unnecessary and will place undue financial burden on utility rate payers.

Response 1:

In the final permit, we have changed the date for the first I&I report submittal for Cowlitz County and WSDOT to February 15, 2009, giving the entities additional time to develop their programs to implement this permit condition. While we understand the Permittees' concerns with this requirement, we believe that it is an important element of facility maintenance and environmental protection. Excess infiltration impairs a facilities ability to treat sewage. Most municipalities in Washington State are undertaking similar efforts as part of their discharge permit. We will work with the entities to implement this requirement, as we work with other municipalities and public entities who are undertaking similar efforts.