

Section 2.9 – Wastewater Treatment

WAC 463-60-195

Proposal – Wastewater treatment.

(1) The application shall describe each wastewater source associated with the facility and for each source, the applicability of all known, available, and reasonable methods of wastewater control and treatment to ensure it meets current waste discharge and water quality regulations.

(2) Where wastewater control involves collection and retention for recycling and/or resource recovery, the applicant shall show in detail the methods selected, including at least the following information: (a) Waste source(s); (b) Average and maximum daily amounts and composition of wastes; (c) The type of storage vessel and the storage capacity and duration; and (d) Any bypass or overflow facilities to the wastewater treatment system(s) or the receiving waters.

(3) Where wastewaters are discharged into receiving waters, the applicant shall provide a detailed description of the proposed treatment system(s), including: (a) Appropriate flow diagrams and tables showing the sources of all tributary waste streams; (b) Their average and maximum daily amounts and composition; (c) Individual treatment units and their design criteria; (d) Major piping (including all bypasses); and (e) Average and maximum daily amounts and composition of effluent(s).

(Statutory Authority: RCW 80.50.040 (1) and (12). 04-21-013, amended and recodified as § 463-60-195, filed 10/11/04, effective 11/11/04. Statutory Authority: RCW 80.50.040(1). 92-09-013, § 463-42-195, filed 4/2/92, effective 5/3/92. Statutory Authority: RCW 80.50.040(1) and Chapter 80.50 RCW. 81-21-006 (Order 81-5), § 463-42-195, filed 10/8/81. Formerly WAC 463-42-470.)

Section 2.9 Wastewater Treatment

Sources of wastewater from the Facility boiler plant effluent (including blowdown, cooling water, and treatment backwash from the two boiler plants), miscellaneous part and equipment wash, fire pump cooling water, and domestic sewage from the Administrative and Support Buildings and the restroom inside the Storage Area boiler building. Most wastewater sources will be connected to the City public sanitary sewer system. Sanitary sewage collected from within the Port area is conveyed to the City's WWTP where it is treated and discharged to the Columbia River under City's NPDES Permit No. WA0024350. All process wastewater discharged from the Facility to the City's sanitary sewer system will undergo pretreatment to ensure compliance with the City's pretreatment program. A copy of the Application for a State Waste Discharge Permit to Discharge Industrial Wastewater to a POTW is included in section 5.2.

2.9.1 Process Wastewater Sources

Sources of process wastewater include the following:

- Feed water treatment effluent from the West Boiler Building and Storage Area boiler
- Blowdown from the West Boiler Building and Storage Area boiler plants
- Blowdown cooling water
- Storage area pump basin sump discharge
- Miscellaneous part and equipment wash water in the rail unloading area
- Fire pump cooling water from the Rail Unloading and Office Area, Storage Area, and Marine Terminal

The boiler plants are expected to produce continuous blowdown, with discharge flow rates fluctuating depending on steam demand. Blowdown temperature at both boiler plants will be lowered to permit allowable levels with a cooling system that utilizes potable water as the coolant. Coolant water will be mixed along with the boiler blowdown. Average and maximum process wastewater steady state flow rates are summarized in Table 2.9-1.

Storage Area pump basin includes a sump pump used to dewater the concrete basin. The basin includes pumps, piping, valving, and appurtenances necessary to transfer crude oil from the product storage tanks to the Marine Terminal and vessel loading area. Waste flows from this basin are calculated assuming (at this time) that the basin is not covered. Average day flows were calculated distributing the annual rainfall total of 38.9 inches per year to determine gpd.

Maximum rainfall was calculated using the 100-year storm rainfall event of 4.5 inches per day.

Miscellaneous part and equipment washing will be completed in a designated area located within the Rail Unloading and Office Area. Wash water will be generated from a single 5-gpm pressure washer and will be collected and conveyed to the Unloading Facility Containment Tanks.

The fire pumps must be put through a 30-minute maintenance cycle once a week. Cooling water from the fire pumps will be discharged for the Rail Unloading, Storage, and Marine Terminal Areas to the containment tanks, sanitary sewer, and stormwater system respectively.

Venting from the crude oil drain line will be piped in a continuous loop back through the top of the rail car, capturing all venting condensate within the rail car and/or crude pipelines.

Table 2.9-1. Process Wastewater Sources

Wastewater Stream	Average Daily Flows (gpd)	Maximum Daily Flows (gpd)
Area 200		
– Miscellaneous Part/Equipment Wash	2,400*	5,000*
– Fire Pump Cooling Water	100*	200*
Area 300		
– Boiler Building Effluent	1,600	1,700
– Pump Basin Sump Effluent & Condensate Discharge	600	7,600
– Fire Pump Cooling Water	100	200
Area 400 – Fire Pump Cooling Water	100*	200*
Area 600 – Boiler Building Effluent	16,200	19,900
Sanitary Wastewater Total Process Wastewater	21,100	34,800
Total Process Wastewater to Sanitary Sewer	18,500	29,400

* Process water discharged to stormwater system for treatment, or stored on-site and hauled off.

The approximate constituent concentrations in the process wastewater are shown in Table 2.9-2. Boiler blowdown and softener backwash concentrations are based on raw water quality from the City’s potable water system and an approximation of the constituent chemical composition of the wastewater based on a preliminary analysis of required pretreatment water polishing and effluent discharge pretreatment. Wastewater discharge concentration standards are based on VMC Chapter 14.10, Pretreatment Ordinance.

Table 2.9-2. Estimated Chemical Makeup of Process Water Discharge

Constituent	Quantity Boiler Blowdown	Softener Backwash	Unit
pH	10.2	8	
Conductivity	1,200	1,000	mmhos
Alkalinity	336	120	mg/L
Hardness	14	500	Mg/L as CaCO ₃
Polyacrylate	250	0	mg/L
Aluminum	<0.1	<0.1	mg/L
Barium	<0.4	<0.4	mg/L
Boron	<0.1	<0.1	mg/L
Bromide	<0.2	<0.2	mg/L
Cadmium	<0.04	<0.04	mg/L
Calcium	0.5	125	mg/L
Chloride	9.3	6,000	mg/L
Chromium	<0.01	<0.01	mg/L
Copper	4	0.2	mg/L
Iron	2	0.1	mg/L
Lead	<0.2	<0.2	mg/L
Lithium	<0.01	<0.01	mg/L
Magnesium	3	50	mg/L

Constituent	Quantity Boiler Blowdown	Softener Backwash	Unit
Manganese	<0.01	<0.01	mg/L
Molybdenum	<0.1	<0.1	mg/L
Nickel	<1	<1	mg/L
Nitrate	0.8	0.32	mg/L
Nitrite	<0.2	<0.2	mg/L
Phosphorus	1	1	mg/L
Potassium	59	59	mg/L
Silica	150	54	mg/L
Sodium	5,880	6,000	mg/L
Strontium	0.1	0.1	mg/L
Sulfate	15	0.72	mg/L

Additional non-process wastewater may be generated intermittently from the unloading area. Non-process wastewater originating from within the unloading area may include rainwater that enters the building from rail cars and is blown in at the entry and exits, oil and other contaminants dripping off rail cars, and fire retardant foam released by the fire suppression system during routine maintenance. Containment drip pans and secondary containment trenches will be installed between and adjacent to the tracks of the rail car unloading building to capture any spilled oil, rainwater, and fire retardant and direct it to sump pumps installed at low points within each containment trench. The sump pumping system will transfer any collected non-process wastewater to a series of aboveground holding tanks where it will be removed by a vacuum truck or pumped out of the tanks and hauled off site to a licensed and approved disposal facility.

2.9.2 Domestic Strength Wastewater Sources

Sources of domestic strength wastewater include the following:

- Domestic strength sanitary discharge from the administrative and support buildings
- Domestic strength sanitary discharge from the Storage Area Boiler Building restroom
- Domestic strength sanitary discharge from the Marine Terminal

Domestic strength sanitary wastewater from the Administrative and Support Buildings and Boiler Building restroom will consist primarily of domestic waste from kitchen/break room, restroom facilities, and shower areas. No pretreatment is proposed at these locations. Discharges from both the Administrative and Support Buildings and Boiler Building restroom will be discharged directly to the sanitary sewer. Marine Terminal (Area 400) employees will use portable toilets located at the Marine Terminal. The waste from the Marine Terminal will be hauled off site (see Table 2.9-3).

Table 2.9-3. Domestic Wastewater Sources

Wastewater Stream	Average Daily Flows (gallons per day)	Maximum Daily Flows (gallons per day)
Area 200 – Administrative and Support Buildings	5,300	6,100
Area 300 – Boiler Building (restroom)	200	200
Area 400 – Portable toilets	100*	100*
Total Domestic Wastewater	5,600	6,400
Domestic Wastewater to Sanitary Sewer	5,500	6,300

* Domestic wastewater stored on-site and hauled off.

2.9.3 Process Wastewater Treatment Alternatives

Final treatment of all wastewater discharged from the Facility to the public sanitary sewer will be done at the City’s existing WWTP. No treatment process modifications at the WWTP will be necessary to accommodate this project. Pretreatment will be conducted on site per the requirements of the City’s industrial wastewater pretreatment permit. Process wastewater streams requiring pretreatment include blowdown and condensate discharges from the boiler plants. Pretreatment processes for these waste streams will be designed and furnished by the boiler manufacturer in accordance with industry practices.

2.9.4 Selection of Wastewater Treatment Alternatives

The total discharge amount of the Facility’s wastewater flows is not significant when compared to the overall treatment plant flows or capacity. The boiler units and effluent pretreatment systems are standard and therefore a formal alternatives analysis was not necessary for this project. The location of the project within the City’s service area and sanitary sewer service basin of the City WWTP eliminates further alternatives analysis. Discharges will be within the City discharge requirements.

2.9.5 Waste Discharge/Water Quality Standards

Maximum wastewater discharges to the City’s sanitary sewer system by the Facility will account for less than 0.1 percent of the total treatment capacity of the City’s WWTP. The WWTP uses an activated sludge process, UV disinfection, and sludge incineration for treatment, and is rated for a maximum wet weather treatment capacity of 28.26 MGD. Current treatment plant maximum demands listed in the most recent Ecology facility fact sheet dated 2003 is 17.4 MGD. The WWTP is permitted through Ecology and its municipal NPDES Individual Permit WA0024350.

New wastewater sources will be connected to the existing public sanitary sewer via a combination of new gravity and pressure sewer lines. A small sanitary sewer pump station is necessary to convey wastewater from the Area 600 West Boiler Building to the discharge location near the Administrative and Support Buildings. The public sanitary basin to which the Facility discharges contains a single pump station at the southeast corner of the Storage Area.

The City reviewed a pre-application narrative which listed wastewater discharges of 30 gpm and indicated that the City has sufficient wastewater treatment and conveyance capacity to serve the project (Aaron Odegard, City of Vancouver, Personal Communications, July 2013). An Industrial Information Form and copy of the Wastewater Discharge to POTW permit application have been submitted to the City.

Discharges to the City’s sanitary sewer system will comply with VMC Title 14.010 Pretreatment Ordinance. The following discharge limits are specified in VMC 14.010.

Table 2.9-4. Required Wastewater Discharge Constituent Limits

Constituent	Daily Maximum Concentration Limit	Instantaneous Concentration Limit	Unit
pH (minimum)	5.5	N/A	-
pH (maximum)	10.0	N/A	-
Arsenic	0.22	0.44	mg/L
Biological oxygen demand	500	-	ppd
Cadmium	0.14	0.28	mg/L
Chromium	7.22	14.44	mg/L
Chromium (hexavalent)	4.28	8.56	mg/L
Copper	3.67	7.34	mg/L
Cyanide	0.47	0.94	mg/L
Hydrocarbon based Oil & Grease	50.0	-	mg/L
Lead	0.44	0.88	mg/L
Mercury	0.008	0.016	mg/L
Molybdenum	0.42	0.84	mg/L
Nickel	0.90	1.80	mg/L
Selenium	0.31	0.62	mg/L
Silver	1.13	2.26	mg/L
Temperature*	104		mg/L
Thallium	0.53	1.06	mg/L
Zinc	1.64	3.28	mg/L

* Temperature of the total influent measured at the treatment plant.

Discharges additionally will comply with VMC 14.010.050 Prohibited Discharge Standards, VMC 14.010.060 National Categorical Pretreatment Standards, and VMC 14.010.070 State Pretreatment Standards.