



Annual Sanitary Sewer Monitoring Report

Seattle-Tacoma International Airport

For the Period July 1, 2008 through June 30, 2009

October 1, 2009

Prepared by

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Section 1: Introduction

The Port of Seattle NPDES Permit No. WA-002465-1, Part I Special Condition S2.G requires the Port to submit an annual Sanitary Sewer Report. This report summarizes the discharge of the boiler blowdown, cooling tower blowdown, rental carwash, and equipment washrack, bus maintenance facility bus wash and bus maintenance facility chassis blowdown to the Midway Sewer District.

The NPDES Permit was reissued and became effective on April 1, 2009. The sampling parameters, frequency and effluent limits were modified for all sanitary sewer discharges. This annual reporting period overlaps between the current and previous permit requirements.

Part I, Special Conditions S1 and S2 specify the monitoring requirements and effluent limitations. The sections below describe the facilities and a summary of data collected.

Section 2: Waste Stream Descriptions

2.1 Boiler Blowdown

The Seattle-Tacoma International Airport (STIA) boiler room is located on the bottom level of the Main Terminal, under the airport drives. Four boilers, each with a water capacity of approximately 1,570 gallons, are used to heat the Main Terminal. The fourth boiler was commissioned on August 12, 2008. Makeup water to the boilers is drawn from the City of Seattle water supply to the airport. The boilers are typically operated at a gauge pressure of 85 pounds per square inch (psig). Each boiler is equipped with a 1.5-inch blowdown line with a "quick close," manually operated, cylindrical block valve. When a valve for any boiler is open, the discharge (blowdown) from the boiler flows through a common header into a 1000-gallon quench tank. From the quench tank, discharges pass through a flow meter and into the sanitary sewer.

An attempt to calibrate the flow meter that measures the volume of boiler wastewater discharged to the sanitary sewer failed due to test equipment malfunctions. Even though the meter has not been calibrated readings are believed to be accurate. Output from the flow meter is logged in an Apogee digital data controller (DDC) and held in an internal database. Current preventive maintenance procedures call for recalibrating the meter annually.

Bottom blowdown is typically performed once or twice per week, by opening the block valve for approximately 15-20 seconds. (The duration of bottom blowdown was empirically defined through field assays directed at minimizing chloride levels in the system). At the time of blowdown, the shift operator visually checks that the flow meter is working. When the boilers are in operation, pressure on the blowdown lines is approximately 85 psig. Boiler blowdowns have decreased substantially from past years due to water chemistry changes.

The boilers are drained annually for maintenance or to remove condensation from inactive boilers. Maintenance was performed on Boiler #1 from June 27th through September 13th. Boiler #3 maintenance was performed from April 23rd through August 26th. Boilers #2 and #4 maintenance is scheduled during fall and winter of 2009..

Boiler #4 will serve primarily as a back-up for the three boilers that are currently in use. No operational differences are expected with the fourth boiler as far as blow down volume except at initial start up. Table 1 provides a monthly average and peak flow summary for all boiler blowdown discharges based on flow meter data.

2.2 Cooling Tower Blowdown

The STIA cooling towers are located immediately south of the Parking Garage. Two cooling towers were constructed in September 1999 and three additional cooling towers of similar design were constructed in 2002. The cooling towers are typically operated year-round with few shutdowns.

The cooling tower systems include automatic blowdown. Blowdown is triggered by a set point for conductivity (700 micro ohms). An automatic level switch in the sump opens a valve to restore water losses with fresh water, which is supplied by the City of Seattle. The automatic blowdown from the cooling towers has operated since startup. Each cooling tower has a sump capacity of about 32,000-gallons. Including the tower sumps and plumbing lines, the capacity of the entire cooling system is approximately 200,000 gallons.

The flow meter that measures the volume of cooling tower wastewater discharged to the sanitary sewer was calibrated on June 13, 2007. Flow meter readings are electronically recorded and stored by the same DDC used for the boilers. Cooling tower maintenance did not occur during this reporting period. Table 1 provides a monthly average and peak flow summary for all cooling tower wastewater discharges for 2008.

Table 1 – STIA Boilers and Cooling Towers Effluent Limitations

NPDES Permit	Boilers		Cooling Towers	
	Maximum Daily Flow	Average Daily Flow for Month	Maximum Daily Flow	Average Daily Flow for Month
2003 NPDES	2500	500	250,000	16,000
2009 NPDES	15,000	1000	250,000	18,000

Table 2 – STIA Boilers and Cooling Towers Monthly Blowdown Summary

Month	Boilers		Cooling Towers	
	Maximum Daily Flow ^{(a) (c)} (gallons/day)	Average Daily Flow for Month ^{(b) (c)} (gallons/day)	Maximum Daily Flow ^(a) (gallons/day)	Average Daily Flow for Month ^(b) (gallons/day)
July	1430	127	20,667	6503
August	5080 ^(d)	195	38,903	8449
September	1960	101	49,405	8650
October	11,440 ^(e)	852 ^(e)	18,012	4405
November	690	106	22,721	3071
December	280	32	7390	836
January	760	65	7052	1874
February	480	75	12,481	2409
March	410	88	104,191	9685
April	2810	186	59,422	5523
May	600	45	5044	1756
June	260	58	12,461	4190

Note:

- (a) Maximum Discharge Flow is the highest daily measured flow for any 24-hour period during a calendar month.
- (b) Average Daily Flow is calculated as the total discharge during a calendar month divided by the number of calendar days in that month. Actual number of discharges is not recorded.
- (c) Boiler maintenance drainage volumes are included in quantities for daily average and daily maximum flows.
- (d) Maximum daily flow was exceeded due to maintenance performed on Boilers #1 and 2.
- (e) Maximum daily and average monthly flows were exceeded due to commissioning of Boiler #4.

2.3 Rental Carwash Blowdown

The rental car agencies use a multi-bay, partial closed loop vehicle washing system located directly northeast of the main parking garage.

The rental carwash was routed to sanitary sewer from the Industrial Waste System (IWS) in May 2004. On occasion the rental carwash blowdown is rerouted back to the IWS due to line blockages or pump failures. The Port reports this to Ecology on the monthly Discharge Monitoring Reports. When the rental carwash discharges to the IWS, monitoring is conducted per NPDES Part I, Special Conditions S1.A & S2.A.1.

NPDES Permit, Special Conditions S1.B and S2.A.2 regulate the rental carwash blowdown effluent limitations and monitoring requirements. Table 2 summarizes the sampling parameters and frequency.

Table 3 – Rental Carwash NPDES Sampling Parameters & Frequency

NPDES Permit	Oil & Grease (mg/L)	BOD (mg/L)	TSS (mg/L)	Total Glycols (mg/L)	pH	Maximum Daily Flow ^(a) (gallons/day)	Avg Daily Flow for Month ^(b) (gallons/day)	Priority Pollutants & Heavy Metals	
2003	Effluent Limitation	100	Report	Report	Report	=>6 & <9	25,000	20,000	Report
	Sampling Frequency	Monthly	Monthly	Monthly	Monthly	Monthly	Daily	Daily	Annually
2009	Effluent Limitation	100	Report	Report	***	=>6 & <9	80,000	65,000	Report
	Sampling Frequency	Monthly	Monthly	Monthly	Not required	Monthly	Daily	Daily	Once per permit

Note:

- (a) Maximum Discharge Flow is the highest daily measured flow for any 24-hour period during a calendar month.
- (b) Average Daily Flow is calculated as the total discharge during a calendar month divided by the number of calendar days in that month. Actual number of discharges is not recorded.

The rental carwash flow volumes are monitored daily. A flow meter measures the volume of wastewater that is sent to the sanitary sewer line from the rental carwash rack. Even though the meter has not been calibrated readings are believed to be accurate.

Per 2003 NPDES Permit, the priority pollutants were required to be sampled annually during the summer months. The 2009 NPDES Permit requires priority pollutant sampling once per permit cycle the summer prior to permit renewal. A sample for priority pollutants was taken on August 7, 2008 and data submitted to Ecology on October 21, 2008. A hard copy of the data is also provided in Appendix A.

Table 4 – Rental Carwash Blowdown Summary and Analytical Results

Month	Oil & Grease (mg/L)	BOD (mg/L)	TSS (mg/L)	Total Glycols (mg/L)	pH	Maximum Daily Flow^(a) (gallons/day)	Average Daily Flow for Month^(b) (gallons/day)
July	3.75	60	44.4	<20	6.68	58,587	53,659
August	5.2	69	129	<20	7.11	57,717	53,683
September	3.7	43	60	<20	7.24	58,753	52,704
October	2.56	45	46.8	<20	7.02	59,517	52,180
November	4.2	35	94.3	<20	7.35	63,984	52,988
December	5.4	34	123	<20	6.72	68,601	55,559
January	11.9	40	248	<20	8.26	58,256	52,683
February	3.11	37	87	<20	8.32	55,172	55,162
March	2.85	40	103	<20	7.58	55,402	50,434
April	6.1	43	105	NR ^(c)	7.08	58,627	53,174
May	5.5	72	60	NR ^(c)	7.24	56,955	61,799
June	6.9	42.8	113	NR ^(c)	6.82	62,354	60,914

Note:

- (a) Maximum Discharge Flow is the highest daily measured flow for any 24-hour period during a calendar month.
- (b) Average Daily Flow is calculated as the total discharge during a calendar month divided by the number of calendar days in that month. Actual number of discharges is not recorded.
- (c) Total Glycols sampling parameter is no longer required per 2009 NPDES Permit.

The daily maximum and/or monthly average flow rates exceeded NPDES Permit discharges limits from July 2008 to March 2009. The high flow volumes are due to a combination of high intensity rain events in conjunction with peak rental car periods due to increased number of travelers. In addition, one of the rental car agencies modified its carwash and it utilizes higher volumes of water during the washing process. The flow discharge volumes were modified in the 2009 permit to represent the operating changes that occurred during the previous permit cycle.

2.4 Equipment Washrack

The Equipment Washrack discharge was modified in the 2009 Permit Application. It previously was located on the mid-east portion of the airport, west of the Delta Airlines ground service maintenance facility. This wash rack was installed in 2003 for ground service equipment cleaning and pressure washing and is no longer in service.

The Port plans to construct a new Equipment Washrack facility. The maximum daily discharge flow is estimated to be 5,000 gpd. The Port will notify Ecology prior to operations.

2.5 Bus Maintenance Facility Bus Wash

The Bus Maintenance Facility Bus Wash is tentatively scheduled to be constructed in 2010 as part of the Bus Maintenance Facility Project. The Bus Maintenance Facility Bus Wash blowdown is from a drive-through automated bus wash bay. No maintenance activities are planned for the bus wash building including windshield fluid refills or checking oil level or tire pressure. Trenched drains serving the bus wash bay will drain to an oil water separator prior to discharge to Midway Sewer District.

It is estimated that the maximum average monthly discharge from the bus maintenance facility bus wash system blowdown will be 3280 gpd. The maximum daily discharge flow is estimated to be 15,350 gpd. The Port will notify Ecology prior to operations.

2.6 Bus Maintenance Facility Chassis Wash Bay

The Bus Maintenance Facility Chassis Wash Bay is tentatively scheduled to be constructed in 2010 as part of the Bus Maintenance Facility Project. The Bus Maintenance Facility Chassis Wash Bay blowdown will be collected in trench drains and drain to an oil water separator prior to discharge to Midway Sewer District.

It is estimated that the maximum average monthly discharge from the bus maintenance facility chassis wash bay blowdown will be 1100 gpd. The maximum daily discharge flow is estimated to be 1960 gpd. The Port will notify Ecology prior to operations.

APPENDIX A

**Part 1: NPDES Sanitary Sampling
Priority Pollutant Analysis Data Summary**
August 7, 2008

<i>Method Group</i>	<i>Parameter</i>	<i>RCW</i>
Asbestos (mfl)	Asbestos	U 1.755
Cyanide (mg/L)	Cyanide	U 0.005
Pesticides (µg/L)	4,4'-ddd	U 0.10
	4,4'-dde	U 0.10
	4,4'-ddt	U 0.10
	Aldrin	U 0.050
	Alpha-bhc	U 0.050
	Beta-bhc	U 0.050
	Camphchlor	U 5.0
	Chlordane, Alpha	U 0.050
	Chlordane, Gamma	U 0.050
	Delta-bhc	U 0.050
	Dieldrin	U 0.10
	Endosulfan I	U 0.050
	Endosulfan II	U 0.10
	Endosulfan Sulfate	U 0.10
	Endrin	U 0.10
	Endrin Aldehyde	U 0.10
	Gamma-bhc (lindane)	U 0.050
	Heptachlor	U 0.050
	Heptachlor Epoxida	U 0.050
	PCB's (µg/L)	Aroclor-1016
Aroclor-1221		U 1.0
Aroclor-1232		U 1.0
Aroclor-1242		U 1.0
Aroclor-1248		U 1.0
Aroclor-1254		U 1.0
Aroclor-1260		U 1.0
Dioxin (pg/L)	2,3,7,8-TCDD	U 1.10
Total Metals (mg/L)	Antimony	0.06
	Arsenic	U 0.05
	Beryllium	U 0.001
	Cadmium	U 0.002
	Chromium	0.017
	Copper	0.448
	Lead	0.02
	Nickel	0.02
	Selenium	U 0.05
	Silver	U 0.003
	Thallium	U 0.05
	Zinc	0.57
Mercury (mg/L)	Mercury	U 0.0001
VOC's (µg/L)	1,1,1-trichloroethane	U 1.0
	1,1,2,2-tetrachloroethane	U 1.0
	1,1,2-trichloroethane	U 1.0
	1,1-dichloroethane	U 1.0
	1,1-dichloroethylene (1,1-dichloroethene)	U 1.0
	1,2-dibromoethane	U 1.0
	1,2-dichloroethane	U 1.0
	1,2-dichloropropane	U 1.0
	2-chloroethyl Vinyl Ether	U 5.0
	Acrolein	U 10
	Acrylonitrile	U 5.0
	Benzene	U 1.0
	Bromodichloromethane	U 1.0
	Bromomethane	U 1.0
	Carbon Tetrachloride	U 1.0
	Chlorobenzene	U 1.0
	Chlorodibromomethane (Dibromochloromethane)	U 1.0
	Chloroethane	U 1.0
	Chloroform	1.6
	Chloromethane	U 1.0
	Cis-1,3-dichloropropene	U 1.0
	Dichloromethane (Methylene Chloride)	U 2.0
	Ethylbenzene	U 1.0
	Tetrachloroethene (Tetrachloroethylene)	U 1.0
	Toluene (methylbenzene)	3.3
	Trans-1,2-dichloroethene	U 1.0
	Trans-1,3-dichloropropene	U 1.0
	Tribromomethane (Bromoform)	U 1.0
	Trichloroethylene (Trichloroethene)	U 1.0
	Vinyl Chloride	U 1.0

**Part 1: NPDES Sanitary Sampling
Priority Pollutant Analysis Data Summary**
August 7, 2008

<i>Method Group</i>	<i>Parameter</i>	<i>RCW</i>
SVOC's (µg/L)	1,2,4-trichlorobenzene	U 1.0
	1,2-dichlorobenzene	U 1.0
	1,2-diphenylhydrazine	U 1.0
	1,3-dichlorobenzene	U 1.0
	1,4-dichlorobenzene	U 1.0
	2,2'-Oxybis(1-Chloropropane)	U 1.0
	2,4,6-trichlorophenol	U 5.0
	2,4-dichlorophenol	U 5.0
	2,4-dimethylphenol	U 1.0
	2,4-dinitrophenol	U 10
	2,4-dinitrotoluene	U 5.0
	2,6-dinitrotoluene	U 5.0
	2-chloronaphthalene	U 1.0
	2-chlorophenol	U 1.0
	2-nitrophenol	U 5.0
	3,3'-dichlorobenzidine	U 5.0
	4,6-dinitro-2-methylphenol	U 10
	4-bromophenyl Phenyl Ether	U 1.0
	4-chloro-3-methylphenol	U 5.0
	4-chlorophenyl Phenyl Ether	U 1.0
	4-nitrophenol	U 5.0
	Acenaphthene	U 1.0
	Acenaphthylene	U 1.0
	Anthracene	U 1.0
	Benzidine	U 10
	Benzo(a)anthracene	U 1.0
	Benzo(a)pyrene	U 1.0
	Benzo(b)fluoranthene	U 1.0
	Benzo(g,h,i)perylene	U 1.0
	Benzo(k)fluoranthene	U 1.0
	Benzyl Butyl Phthalate	1.1
	Bis(2-chloroethoxy)methane	U 1.0
	Bis(2-chloroethylether)	U 1.0
	Bis(2-ethylhexyl)phthalate	24
	Chlorophenols	U 5.0
	Chrysene	U 1.0
	Dibenz(a,h)anthracene	U 1.0
	Diethyl Phthalate	U 1.0
	Dimethyl Phthalate	U 1.0
	Di-n-butylphthalate	U 1.0
	Di-n-octylphthalate	1.6
	Fluoranthene	U 1.0
	Fluorene	U 1.0
	Hexachloro-1,3-butadiene	U 1.0
	Hexachlorobenzene	U 1.0
	Hexachlorocyclopentadiene	U 5.0
	Hexachloroethane	U 1.0
	Indeno(1,2,3-cd)pyrene	U 1.0
	Isophorone	U 1.0
	Methanamine, N-methyl-n-nitroso	U 5.0
	Naphthalene	U 1.0
	Nitrobenzene	U 1.0
	N-nitroso-di-n-propylamine	U 5.0
	N-nitrosodiphenylamine	U 1.0
	Pentachlorophenol	U 5.0
	Phenanthrene	U 1.0
	Phenol	U 1.0
	Pyrene	U 1.0

General Footnotes
Bold = Detected above MRL

Laboratory Qualifier Definitions
U = not detected at applicable reporting limit
J = Estimated value, below calibration range
B = Analyte detected in associated method blank