

Annual Construction Stormwater Monitoring Report

Seattle-Tacoma International Airport

For the Period July 1, 2021 through June 30, 2022

September 29, 2022

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Section 1: Introduction

The Port of Seattle (Port) National Pollutant Discharge Elimination System (NPDES) permit WA0024651 is broken down into three sections: Part 1: Industrial Wastewater, Part 2: Industrial Stormwater and Part 3: Construction Stormwater. NPDES Permit Part 1 Special Condition S2.F requires an annual summary of construction stormwater monitoring results. The twelve-month period is defined as July 1, 2021 through June 30, 2022. This report provides a summary of the number of projects, active outfalls, number of construction stormwater events and permit compliance results during this period.

1.1 Background

The Port operates and maintains the Seattle-Tacoma International Airport (STIA). STIA routinely undergoes facility upgrades to improve outdated infrastructure and to increase facility and operational capacity to accommodate the increased number of passengers and meet other needs of the airline industry. Many of these upgrades involve ground disturbing activities requiring construction stormwater runoff monitoring in accordance with Part 3 Special Condition S1. The monitoring results summarized in this report document permit compliance.

Section 2: Construction Stormwater Monitoring Requirements

The Port develops and submits a site-specific construction stormwater monitoring plan prior to construction activities for any project that disturbs one (1) or more acres. The monitoring plan provides a brief project description, identifies construction stormwater outfalls, stormwater treatment processes (if applicable), reporting requirements and non-compliance notification contacts and procedures. Monitoring continues until a site stabilization notification is submitted to Ecology.

Construction stormwater monitoring is defined under Part 3, Special Condition 3S2 is broken into three categories:

- Non-Chemically Treated Discharge Monitoring
- Continuous Chemical Treatment Monitoring
- Batch Treatment Monitoring.

Port personnel work with project and construction management teams to identify the appropriate form of treatment for each site and how the site will be monitored to meet permit requirements. Each category of treatment has specific monitoring frequencies and effluent limitations. **Table 1** provides a summary of active construction projects in the reporting period and the form of treatment used at each.

A construction outfall grid was developed to determine the location of potential construction stormwater discharges so that they would be identified in the Airport's NPDES permit. These locations discharge into the three (3) receiving waters surrounding STIA. These grids or boxes reflect the associated authorized outfalls referenced in Part III, Special Condition 3S1.A Table III. The Port has the potential to utilize 62 construction outfalls identified in the NPDES permit. Each outfall can have a non-chemical construction stormwater discharge, batch-treated chemical stormwater discharge and/or a continuous flow chemical treated stormwater discharge.

The *NPDES Construction Monitoring Outfall Areas Map (Figure 1)* provides a reference for all potential construction stormwater outfall locations at STIA

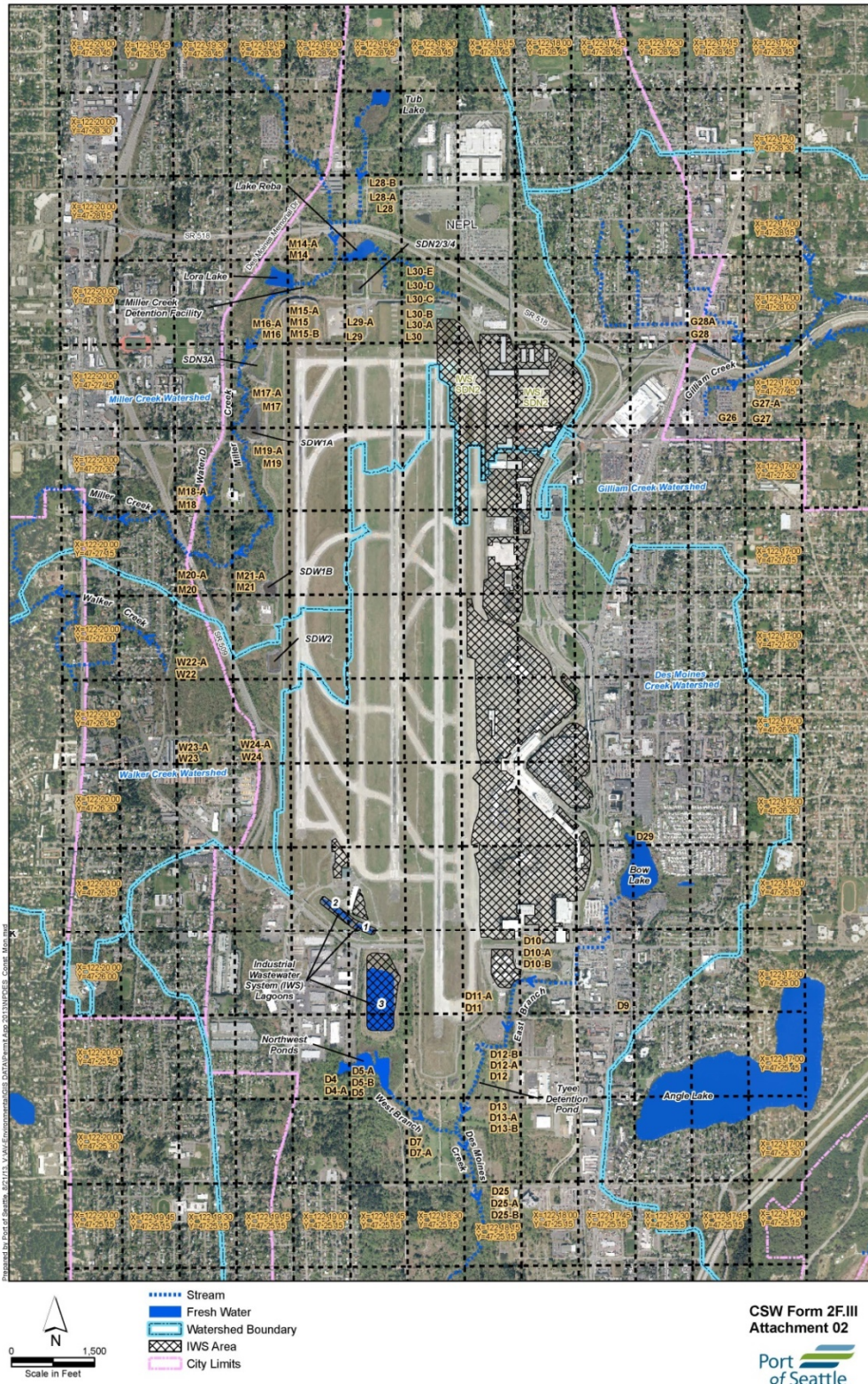
The Port and Ecology track each outfall under three (3) possible operating conditions:

- Non-operational
- Inactive
- Active.

A *non-operational* outfall has never been activated as a construction stormwater outfall during the current permit cycle. An *inactive* outfall has previously been active but during a particular month(s) there was no construction activity discharging to that outfall. An *active* outfall receives stormwater from a construction site with ground disturbing activity. The Port provides an outfall summary to Ecology along with the monthly Discharge Monitoring Report (DMR) submittal to track operating outfall status. The DMRs summarize the monitoring results from all active outfalls.

The Port may also discharge construction stormwater to the Industrial Waste Treatment Plant (IWTP). All stormwater sent to the IWTP is treated and discharged per NPDES permit Part I, Special Conditions S1.A Table 1-1 & S2.A.1 Table S2-1.

Figure 1 - Construction Stormwater Outfall Map



**Table 1 - Project Summary and Treatment Type Utilized
(July 2021 - June 2022)**

Project	July	August	September	October	November	December	January	February	March	April	May	June
Logistics Site	Non-Chem	Non-Chem	Non-Chem	Non-Chem	Non-Chem	Non-Chem	Non-Chem	Non-Chem	Non-Chem	Non-Chem	Non-Chem	Non-Chem
2021 Airfield Pavement Replacement Project	Non-Chem	Non-Chem	Non-Chem	Non-Chem	Non-Chem	Non-Chem	Inactive	Inactive	Inactive	Inactive	Inactive	Inactive
2022 Airfield Improvement Project	Inactive	Inactive	Inactive	Inactive	Inactive	Inactive	Inactive	Inactive	Inactive	Non-Chem	Non-Chem/ Chem	Non-Chem/ Chem
Air Cargo Road Improvements Project	Non-Chem	Non-Chem	Non-Chem	Non-Chem	Non-Chem	Non-Chem	Non-Chem	Non-Chem	Non-Chem	Inactive	Inactive	Inactive

Non-Chem: Non-Chemically Treated Discharge
Chem: Chemical Treatment Discharge

2.1 Non-Chemically Treated Discharge Monitoring

Non-chemically treated discharge monitoring is triggered when conventional erosion and sediment control BMPs are utilized to meet water quality standards.

A non-chemically treated discharge monitoring event is triggered when the airport receives 0.5 inches or greater of rain in a 24-hour period. The 24-hour period is defined as being from 8:00am to 8:00am to ensure safety of field samplers and, if necessary, allows for Best Management Practice (BMP) adjustments or repairs to be completed that working day. The Port NPDES permit requires non-chemical treatment discharges be monitored upstream and downstream of the outfall. The upstream monitoring location is approximately five (5) feet upstream of the discharge and the downstream monitoring location is determined by Ecology's RivPlum Model and is no greater than 100 feet downstream or at the nearest accessible point. **Table 2** summarizes the Non-chemically treated discharge monitoring parameters and effluent limitations.

Table 2 - Non-Chemically Treated Monitoring Parameters & Effluent Limits

Monitoring Parameter	Effluent Limit
Turbidity ^(a)	5 NTU or 10% increase above background
pH	6.5 to 8.5 ^(b)
Total Petroleum Hydrocarbons	5 mg/L ^(c)
Flow	Report

Footnotes:

- (a) If background turbidity is 50 NTU or less, then the turbidity in the receiving water shall not exceed 5 NTU above background. If background turbidity is greater than 50 NTU, then cannot have 10% increase in turbidity.
- (b) With human caused variation must be within .2 units.
- (c) TPH shall only be measured and sampled if visible sheen is observed.

2.2 Continuous Chemically Treated Discharge Monitoring

Continuous chemical treatment is used to treat runoff in those cases where site specific conditions may limit the ability of traditional erosion and sediment control BMPs to meet water quality standards in the receiving water. Ecology defines chemical treatment methods and requirements in BMP C250, *Western Washington Stormwater Management Manual, Volume II*. The Port's NPDES permit specifies monitoring parameters and frequencies in addition to Ecology's General Use Level Designation requirements.

The 2022 Airfield Improvement Project utilized a continuous chemical treatment system which discharged to the L29C-Lake Reba outfall beginning May 2022. The Port's NPDES permit specifies monitoring parameters and frequencies. The project included a site-specific monitoring plan and discharges were reported to Ecology on the monthly

DMR. **Table 3** summarizes the Chemically treated discharge monitoring parameters and effluent limitations.

Table 3 - Chemically Treated Monitoring Parameters & Effluent Limits

Monitoring Parameter	Effluent Limit
Turbidity ^(a)	5 NTU or 10% increase above background
pH	6.5 to 8.5 ^(b)
Total Petroleum Hydrocarbons	5 mg/L ^(c)
Total Dissolved Solids	500 mg/L
Flow	Report

Footnotes:

- (a) If background turbidity is 50 NTU or less, then the turbidity in the receiving water shall not exceed 5 NTU above background. If background turbidity is greater than 50 NTU, then cannot have 10% increase in turbidity.
- (b) With human caused variation must be within .2 units.
- (c) TPH shall only be measured and sampled if visible sheen is observed.

2.3 Batch Chemically Treated Discharge Monitoring

Batch chemical treatment is also utilized when traditional BMPs may not be adequate. The chemical treatment methods and requirements are also defined in BMP C250, *Western Washington Stormwater Management Manual, Volume II*.

The Port did not perform any batch chemical treatment during this reporting period. The Port's NPDES permit specifies monitoring parameters and frequencies. If the Port uses batch chemical treatment for future construction stormwater projects it will be identified in the site-specific monitoring plan and reported to Ecology on the monthly DMR.

Section 3: Construction Stormwater Monitoring Results Summary

This section summarizes the construction stormwater monitoring events and results. All data summarized in this section has been reported to Ecology on monthly DMRs and is included in **Tables 4 and 5**.

3.1 Non-Chemically Treated Discharge Monitoring Summary

The Port monitored thirty (30) 0.5-inch of rain within 24-hour storm events during this period. All the monitoring results were reported in the monthly DMRs. During this period there were up to four (4) active construction stormwater outfalls. The Port discharged into Des Moines Creek and Lake Reba. **Table 4** provides a monthly summary of the number of 0.5-inch/24-hour stormwater events.

Table 4 - Summary 0.5-Inch within 24-Hour Monitoring Events

Month (July 2021 – June 2022)	Number 0.5-Inch Stormwater Events
July	0
August	0
September	3
October	3
November	8
December	1
January	5
February	1
March	4
April	1
May	2
June	2

Non-Chemically Treated Discharge Data Results (Table 5) provides the instream monitoring data results submitted on the DMR. Please note that **Table 5** reflects the maximum and minimum data results if there were multiple 0.5 inch/24-hour storm events during the month.

The non-chemical construction monitoring occurs in the receiving water which results in many outside sources comingling with construction discharges in the receiving water.

**Table 5 - Non-Chemically Treated Discharge
(July 2021 - June 2022)**

Parameter	Month	Outfalls			
		D10	D13	D5	L29
Flow (mgd)	Jul-21	ND	ND	ND	ND
	Aug-21	ND	ND	ND	ND
	Sep-21	1.505	0.344	ND	ND
	Oct-21	2.37	0.13	ND	0.65
	Nov-21	4.21	0.86	ND	1.38
	Dec-21	0.52	0.3	ND	ND
	Jan-22	3.87	0.77	ND	ND
	Feb-22	3.1	0.43	ND	ND
	Mar-22	2.06	0.69	ND	ND
	Apr-22	1.51	0.34	ND	ND
	May-22	ND	0.3	ND	0.77
	Jun-22	ND	0.13	1.51	0.13
	Oil and Grease Total Petroleum Hydrocarbon (mg/L)	Jul-21	ND	ND	ND
Aug-21		ND	ND	ND	ND
Sep-21		No Sheen	No Sheen	ND	ND
Oct-21		No Sheen	No Sheen	ND	No Sheen
Nov-21		No Sheen	No Sheen	ND	No Sheen
Dec-21		No Sheen	No Sheen	ND	ND
Jan-22		No Sheen	No Sheen	ND	ND
Feb-22		No Sheen	No Sheen	ND	ND
Mar-22		No Sheen	No Sheen	ND	ND
Apr-22		No Sheen	No Sheen	ND	ND
May-22		ND	No Sheen	ND	No Sheen
Jun-22		ND	No Sheen	No Sheen	No Sheen
pH [min \ max] (s.u.)		Jul-21	ND	ND	ND
	Aug-21	ND	ND	ND	ND
	Sep-21	7.0\7.4	7.1\7.5	ND	ND
	Oct-21	6.5\7.2	6.6\7.3	ND	6.9\6.9
	Nov-21	6.5\6.7	6.5\6.7	ND	6.5\6.9
	Dec-21	6.5\6.5	6.6\6.6	ND	ND
	Jan-22	6.3\6.7	6.3\7.0	ND	ND
	Feb-22	6.3\6.3	6.4\6.4	ND	ND
	Mar-22	6.1\6.6	6.4\6.9	ND	ND
	Apr-22	6.6\6.6	6.6\6.6	ND	ND
	May-22	ND	6.3\7.0	ND	6.5\6.8
	Jun-22	ND	6.4\7.2	6.2\6.9	6.5\6.6
	Turbidity Background <=50 NTU	Jul-21	ND	ND	ND
Aug-21		ND	ND	ND	ND
Sep-21		2.53	0.4	ND	ND
Oct-21		0.76	0.2	ND	0
Nov-21		2.9	0.6	ND	3.8
Dec-21		0.81	0.24	ND	ND
Jan-22		4.7	1.0	ND	ND
Feb-22		0.6	1.0	ND	ND
Mar-22		1.8	0.2	ND	ND
Apr-22		3.8	0	ND	ND
May-22		ND	0	ND	0
Jun-22		ND	0	0	1.3
Turbidity Background >50 NTU (%)		Jul-21	ND	ND	ND
	Aug-21	ND	ND	ND	ND
	Sep-21	NA	NA	ND	ND
	Oct-21	NA	NA	ND	NA
	Nov-21	NA	NA	ND	NA
	Dec-21	NA	NA	ND	ND
	Jan-22	NA	NA	ND	ND
	Feb-22	ND	NA	ND	ND
	Mar-22	ND	NA	ND	ND
	Apr-22	NA	NA	ND	ND
	May-22	ND	NA	ND	NA
	Jun-22	ND	NA	NA	NA

Notes:

mgd = million gallons per day

mg/l = milligrams per liter

*For months with multiple monitoring days, the max (or min) values are reported here accordingly.

s.u. = standard units

ntu = nephelometric turbidity units

ND = No Discharge

NA = Not Applicable

IA = Inactive

The Port performs site inspections to ensure BMPs are working effectively, and unanticipated discharges are not occurring from the project site.

During this monitoring period there were monitoring results that exceeded permit limitations. All exceedances are associated with non-Airport influences. The non-chemical construction monitoring occurs in the receiving water which results in many outside sources comingling with construction discharges in the receiving water. The Port performs site inspections to ensure BMPs are working effectively, and unanticipated discharges are not occurring from the project site.

3.1.1 Turbidity

During the monitoring period there were no events where turbidity background exceedances were recorded.

3.1.2 pH

There were eleven (11) pH exceedances during this period. In each exceedance the upstream and downstream pH values were below the 6.5 S.U. effluent limit while the Port's discharge to the outfalls was above or equal to the upstream pH value in 8 of the 11 cases. Thus, the Port does not believe the exceedances were associated with Port activity. **Table 6** below describes each exceedance and the numeric value. The depressed pH of the creek in these instances is related to basin-wide effects of low pH rainwater on the receiving water.

Table 6 - pH Limit Exceedance Notifications Summary

Date	Outfall	pH	Discussion
1/3/22	D10	6.3	The projects discharging to the D10 outfall did not have any low pH generating activity occurring. The primary project activities were joint seal and concrete panel replacement. There was no evidence the depressed pH was associated with construction activity.
	D13	6.1	In the D13 drainage area there were construction laydown, bus maintenance facility and employee parking activities. Site inspections did not identify any activities that would reduce pH. Due to region wide depressed pH values and lack of pH sources, the Port believes the depressed pH value was related to basin-wide effects of low pH rainwater on the receiving water.
1/7/22	D10	6.3	The projects discharging to the D10 outfall did not have any low pH generating activity occurring. The primary project activities were joint seal and concrete panel replacement. There was no evidence the depressed pH was associated with construction activity.
1/11/22	D13	6.3	In the D13 drainage area there were construction laydown, bus maintenance facility and employee parking activities. Site inspections did not identify any activities that would reduce pH. Due to region wide depressed pH values and lack of pH sources, the Port believes the depressed pH value was related to basin-wide effects of low pH rainwater on the receiving water.
2/28/22	D10	6.3	The projects discharging to the D10 outfall did not have any low pH generating activity occurring. The primary project activities were joint seal and concrete panel replacement. There was no evidence the depressed pH was associated with construction activity.
	D13	6.8	In the D13 drainage area there were construction laydown, bus maintenance facility and employee parking activities. Site inspections did not identify any activities that would reduce pH. Due to region wide depressed pH values and lack of pH sources, the Port believes the depressed pH value was related to basin-wide effects of low pH rainwater on the receiving water.
3/21/22	D10	6.4	The projects discharging to the D10 outfall did not have any low pH generating activity occurring. The primary project activities were joint seal and concrete panel replacement. There was no evidence the depressed pH was associated with construction activity.
	D13	6.3	In the D13 drainage area there were construction laydown, bus maintenance facility and employee parking activities. Site inspections did not identify any activities that would reduce pH. Due to region wide depressed pH values and lack of pH sources, the Port believes the depressed pH value was related to basin-wide effects of low pH rainwater on the receiving water.
5/7/22	D13	6.4	In the D13 drainage area there were construction laydown, bus maintenance facility and employee parking activities. Site inspections did not identify any activities that would reduce pH. Due to region wide depressed pH values and lack of pH sources, the Port believes the depressed pH value was related to basin-wide effects of low pH rainwater on the receiving water.
6/5/22	D5	6.6	The projects discharging to the D5 outfall did not have any low pH generating activity occurring. The primary project activities were joint seal and concrete panel replacement. There was no evidence the depressed pH was associated with construction activity.
	D13	6.4	In the D13 drainage area there were construction laydown, bus

			maintenance facility and employee parking activities. Site inspections did not identify any activities that would reduce pH. Due to region wide depressed pH values and lack of pH sources, the Port believes the depressed pH value was related to basin-wide effects of low pH rainwater on the receiving water.
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3.1.3 Total Petroleum Hydrocarbons

The Port did not visually identify a sheen during any of the monitoring events.

3.1.4 Flow

The Port monitored flow during all monitoring events.

3.2 Continuous Chemical Treatment Monitoring Summary

The Port did not perform any continuous chemical treatment during this reporting period. The Port's NPDES permit specifies monitoring parameters and frequencies. If the Port uses batch chemical treatment for future construction stormwater projects it will be identified in the site-specific monitoring plan and reported to Ecology on the monthly DMR.

3.2.1 Turbidity

All construction discharges were below 5 NTUs maximum daily average. There were no exceedances during this reporting period.

3.2.2 pH

There were eleven (11) pH exceedances during the monitoring events which are believed to be the result of region wide depressed pH values and a lack of pH sources. Under Part 2 of the permit, a low pH study is underway in the SDD06A and SDE4/S1 basins which are upstream of the D13 and D10 construction outfalls, respectively. Results of this study are on-going and preliminary findings will be provided to the Department of Ecology in late 2022.

3.2.3 Total Petroleum Hydrocarbons

The Port did not visually identify a sheen during any of the monitoring events.

3.2.4 Flow

The Port monitored flow during all monitoring events.

3.3 Batch Chemical Treatment Monitoring Summary

The Port monitored two (2) discharges of batch chemical treatment during this reporting period. The Port discharged into the L29C-Lake Reba outfall from the 2022 AIP project which is utilizing the batch plant to manufacture concrete for paving operations. *Chemically Treated Discharge Data Results (Table 7)* provides the project's discharge monitoring data results submitted on the DMR.

**Table 7. Batch Chemically Treated Discharge
L29C – Lake Reba Outfall
(May 2022-June 2022)**

Parameter	Month	Outfall
		L29C
Flow (mgd)	May-22	0.03368
	June-22	0.02286
Oil and Grease Total Petroleum Hydrocarbon (mg/L)	May-22	No sheen
	June-22	No sheen
pH [min \ max] (s.u.)	May-22	6.77\8.42
	June-22	6.52\8.06
Turbidity Background <=50 NTU	May-22	1.2
	June-22	4.3
Turbidity Background >50 NTU (%)	May-22	NA
	June-22	NA
Total Dissolved Solids (TDS) (mg/L)	May-22	85
	June-22	167

Notes:

mgd = million gallons per day

mg/L = milligrams per liter

s.u. = standard units

ntu = nephelometric turbidity units

NA = not applicable

*For months with multiple monitoring days, the max (or min) values are reported here accordingly.