90b - Actions Taken Pursuant to S4F

The City, through Seattle Public Utilities (SPU), provided notifications to the Department of Ecology under S4.F of potential water quality problems that may be related to discharges from the City of Seattle's (City) municipal separate storm sewer system (MS4). The City continues to apply and implement its programs for stormwater management and to seek improvement to those programs through increased understanding of stormwater impacts and mitigation tools. Per the requirement of S4.F.3.d, Seattle is providing the status of implementation and the results of any monitoring, assessment or evaluation efforts conducted during 2015 related to the Seattle Iron and Metals S4F notification and the Lower Duwamish Waterway S4F notification.

Starting with the Annual Report submitted in March 2017, the source control activities and information related to these Adaptive Management Response Plans will be incorporated and submitted with the Annual Report that is required as a result of SPU's S4F notification for Lower Duwamish Waterway (LDW) Sediments(December 2, 2013). Ecology's response in June 2014 to the LDW Sediments S4.F notification noted that an adaptive management response under S4.F.3 is warranted "for all the City's MS4 Discharge to the LDW, include City MS4 discharges to outfalls not owned or operated by the City." Ecology's response went on to direct SPU to incorporate future adaptive management in the S. Myrtle Street drainage basin into the adaptive management plan for source control in the City-owned MS4 portions of the LDW. The plan is known as "Seattle's Source Control Plan for the Lower Duwamish Waterway." SPU provided Ecology with a Source Control Implementation Plan (SCIP) in March of 2015 and has been implementing the actions contained in the SCIP during 2015. SPU will continue to use the SCIP to guide source control activities during 2016 and looks forward to working with Ecology as they implement a broader source control strategy for controlling sources of pollutants to prevent or minimize the likelihood that in-waterway sediments will be recontaminated.

Seattle Iron & Metals S4F Report for 2015

Background

SPU has been engaged with Ecology in inspection and enforcement of City code and a state issued NPDES permit, respectively, regarding a private business, Seattle Iron & Metals Corp, 601 S. Myrtle St. Evidence indicated that the source control BMPs implemented by the business have failed to contain and eliminate the discharge of pollutants from the work site of the business into the City's MS4. The City's MS4 discharges into the Duwamish Waterway, which is part of the Lower Duwamish Waterway (LDW) Superfund site. SPU has been engaged in storm drain solid sampling from private and public catch basins in the City's MS4 as part of the LDW source control program. Results from storm drain samples collected by SPU in 2008-2009 indicated elevated PCBs in the MS4 on S. Myrtle St. that could be associated with operations at Seattle Iron & Metals. SPU conducted a business inspection at Seattle Iron & Metals on January 30, 2009 and after sampling both the MS4 in

the vicinity of the property and onsite catch basins, sent a corrective action letter on July 10, 2009, requiring the following improvements:

- Eliminate trackout of sediment and dirt onto adjacent City streets.
- Cover all outside materials that have a potential to leach or spill to the Duwamish River, including scrap piles adjacent to the dock where gaps in the dock permit material and stormwater to discharge directly to the river.
- Remove scrap metal storage bins from the City right-of-way.
- Prepare a written spill response plan for the site and post at an appropriate location onsite.
- Improve onsite housekeeping by regularly 1) sweeping the lot, 2) checking catch basins for sediment accumulation and maintaining as needed, and 3) cleaning up leaks/spills when they occur and employing the spill plan when necessary.

As a result of the business inspection and source tracing sampling of the MS4, SPU jetted and cleaned all the MS4 and associated MS4 structures (inlets, catch basins and maintenance holes) to remove sediment from the City's MS4 that discharges to the LDW at S. Myrtle St.

Following the jetting and cleaning of the MS4, SPU conducted a joint inspection of Seattle Iron & Metals with EPA. During the inspection, SPU and EPA collected sediment samples from the roofs of the main office and maintenance buildings, as well as the catch basins in the Seattle Iron & Metals employee parking lot and from a City-owned catch basin in the right-of-way adjacent to Seattle Iron & Metals' property. The data collected by SPU indicated that contaminants in the City's MS4, that had accumulated after jetting and cleaning, continued to exceed source control screening levels and these contaminants might be associated with stormwater discharges from Seattle Iron & Metals. Because of this, SPU issued a Notice of Violation (NOV) to Seattle Iron & Metals on July 8th, 2010. Upon receipt of the NOV, Seattle Iron & Metals requested, and SPU agreed to a, Voluntary Compliance Agreement (VCA) on September 29th, 2010. The VCA requires Seattle Iron & Metals to implement the following source control measures:

A. Roof Drains:

- SIM agreed to survey roofs and drains for solid buildup and provide a report on this survey to SPU for review
- SIM agreed to clean roof and drains per the roof survey results. Wash water associated with this cleaning will be routed to the onsite treatment system.
- SIM agreed to design a roof drain treatment system and provide the design to SPU by November 15, 2010.
- SIM submitted the engineering plans for the roof drain treatment system to SPU on November 15, 2010. In their submittal, SIM noted that Ecology had indicated that the roof drain system as planned may not satisfy the requirements of SIM's NPDES Industrial Wastewater Discharge permit requirements. SIM requested that SPU and Ecology meet and determine which standard the roof drain system must meet; Seattle Stormwater Code (SMC 22.800-22.808) or Ecology NPDES Industrial Wastewater Discharge permit requirements.

- SPU and Ecology met to discuss this issue and determined that SIM should design the roof drain system to meet the Ecology NPDES Industrial Wastewater Discharge permit requirements.
- SPU referred enforcement of this provision of the VCA to Ecology on June 10, 2011 under Special Condition S5.C.7.b of the 2007 NPDES Phase I Municipal Stormwater Permit.

B. Track Out:
   - SIM will continue to implement a sweeping regiment that includes: sweeping at least once per day at the end of shift, moving employee vehicles to the employee parking lot onsite, rather than in the street, and more frequent sweeping as needed.
   -

C. Storm Drain Cleaning
   - SIM agreed to clean the catch basins located on the south side of S. Myrtle Street from the end of Myrtle St. to 7th Ave. South by November 15, 2010.
     SIM cleaned the catch basins located on the south side of S. Myrtle Street by November 15, 2010.

On April 4, 2013 SPU informed SIM via letter that the VCA had been completed.

<u>SPU Adaptive Management Response Report</u>
Ecology responded to the S4.F Notification on September 20th, 2010 that improved source control efforts by Seattle Iron & Metals will address their contribution to pollutant discharges, but Ecology expressed concern that Seattle Iron & Metals efforts by themselves may not eliminate the problem because there may be contribution to MS4 from an unpaved right-of-way on S. Myrtle St. Because of the potential for contribution to the MS4 from the unpaved right-of-way, Ecology determined that an Adaptive Management Response under condition S4.F.3 was necessary.

SPU submitted the Adaptive Management Response report to Ecology on November 22, 2010. The Adaptive Management Response report addressed the requirements detailed in S4.F.3.a and the required elements requested by Ecology in their September 20, 2010, response to the S4.F notification. Ecology acknowledged receipt of the Adaptive Management Response report on November 29, 2010. However, Ecology required additional actions and information prior to Approval. On April 4, 2011 SPU submitted a revised Adaptive Management report, which was approved on April 20, 2011 by Ecology.

Per the requirements of Special Condition S4.F.3.d, SPU is providing a summary of the status of the Adaptive Management Response report for 2014.

<u>Quarterly Inspections of Catch Basins on S. Myrtle Street</u>
During 2015, SPU monitored solids accumulation in catch basins in the vicinity of SIM. The table below details the results of this monitoring effort.

EQNUM	576148	576126	576140	576158	576162	576145	576165	943593

Location	S Myrtle St cul-de-sac, west	S Myrtle St cul-de-sac, north	north side S Myrtle St, west of SIM	south side S Myrtle St, west of SIM	south side S Myrtle St, east of SIM	S Myrtle St and Fox Ave S	south side S Myrtle St at 7th Ave S	north side S Myrtle St, east of SIM
Type	CBL	CBL	CBL	CBL	CBL	CBL	CBL	CBL
March, 2015								
% Full	7%	16%	43%	80%	33%	32%	53%	44%
June, 2015								
% Full	8%	17%	40%	2%	36%	32%	55%	41%
September, 2015								
% Full	10%	28%	50%	2%	37%	31%	0%	45%
December, 2015								
% Full	9%	15%	43%	12%	40%	39%	8%	37%

Historically CBL 576162 has accumulated solids and required cleaning more frequently than the other catch basins on S. Myrtle Street. In 2013 Seattle Iron and Metals installed two Filtera units adjacent to their driveway on S. Myrtle Street

Quarterly Inspections of Maintenance holes on S. Myrtle St.

During 2014, SPU monitored solids accumulation in the main-line of the MS4 on S. Myrtle St. The table below details the results of this monitoring effort.

EQNUM	599350	599353	599354
Location	S Myrtle St cul-de-sac	S Myrtle St at SIM	S Myrtle St at 7th Ave S
Type	MH	MH	MH
March, 2015			
% Full	0%	0%	0%
June, 2015			
% Full	0%	0%	0%
September, 2015			
% Full	0%	0%	0%
December, 2015			
% Full	0%	0%	0%

Based upon these quarterly inspections, line cleaning on S. Myrtle Street is not needed at this time.

Street Sweeping for Water Quality

S. Myrtle St. was swept by SDOT 39 times in 2015 as part the Street Sweeping for Water Quality Program (SS4WQ). Sweeping on S. Garden Street was added in 2015. S. Garden St. was swept 33 times in 2015. Starting in 2016, the SS4WQ will change from bi-weekly to weekly sweeping arterial streets that drain into the Municipal Storm Sewer System (MS4). The SS4WQ program will continue to sweep S. Myrtle Street and S. Garden Street during 2016.

Unpaved ROW feasibility Study

SPU and SDOT completed and submitted a feasibility study focused on controlling discharges from the unpaved right-of-way on S. Myrtle St to Ecology in 2011. The study concluded that continuation of the actions outlined in the Adaptive Management Response plan (sweeping and MS4 infrastructure inspections) was the best option given evaluation of PCB data from catch basins in the unpaved right-of-way.

Lower Duwamish River Water Quality and Sediments S4F Report for 2015

An S4.F notification was submitted in 2007 to notify Ecology of potential water quality problems that may be related to discharges from the City's MS4 for the Lower Duwamish River. Ecology determined that a report under S4.F.2.a was not necessary, with that determination conditioned on certain City actions. Ecology required the City, beginning with its Phase I Permit Annual Report for 2008, to include a summary of its stormwater management efforts in basins that discharge to the Lower Duwamish River. The City must notify Ecology if Seattle's involvement in Federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and associated Source Control Strategy processes changes or new information becomes available regarding phthalate recontamination in the Lower Duwamish Waterway.

An S4F notification was submitted on December 5, 2013 to notify Ecology of potential sediment quality problems that may be related to discharges from the City's MS4 for the Lower Duwamish Waterway (LDW). Ecology accepted the notification (June 4, 2014) as a general notification for all MS4 discharges to the LDW for all LDW sediment chemicals of concern (COC). The City's draft SCIP (November 2013) fulfills the City's requirement for submittal under S4.F.3.a of an expanded adaptive management response. The City revised the SCIP, and a final draft of the SCIP was submitted to Ecology on March 31, 2015. The City has been implementing the actions contained in the SCIP during 2015 and SPU will continue to use the SCIP to guide source control activities during 2016. The City and Ecology are continuing to review the revised SCIP.

An S4F notification was submitted on September 5, 2014 to notify Ecology of potential sediment quality problems that may be related to discharges from the City's MS4 for the East Waterway (EWW) of the Duwamish Waterway. The City believes that S4.F.2 applies and that the collective efforts in the EWW, including business inspections, source tracing, line cleaning, and other programs, and ongoing source control efforts to support the EWW CERCLA cleanup satisfy the Permit requirements.

The Lower Duwamish River extends from approximately the north end of Harbor Island in the City of Seattle to the upper turning basin in the City of Tukwila. This area is subject to, and is undergoing, contaminated sediment studies and cleanup actions governed by CERCLA and State Model Toxics Control Act (MTCA) cleanup laws. This area includes the East and West Waterway operable units of the Harbor Island Superfund site and the Lower Duwamish Waterway (LDW) Superfund site. The City of Seattle and others are conducting source tracing and source control activities on adjacent upland public and

private properties. Source Control activities are organized and prioritized across drainage areas to minimize the possibility for recontamination of the waterway.

Regarding City stormwater management efforts in basins that discharge to the Lower Duwamish River, the City implements several source tracing programs with specific emphasis to the Lower Duwamish Waterway. These programs include:

- Business Inspections: In support of the clean-up effort, multi-media inspections are conducted, which cover stormwater pollution prevention, hazardous waste management and industrial waste management. In 2015, 180 inspections were conducted with the Lower Duwamish Waterway (LDW) and East Waterway Basins (EWW). Each business is inspected for compliance with the City's Stormwater Code and required to be brought into compliance with all relevant best management practices (BMP) for source control. The inspections resulted in 153 Corrective Action Letters, and none of these sites were referred to Ecology for potential NPDES Industrial Stormwater permit coverage. Seven facilities were issued NOV's for non-compliance with the City's Stormwater Code, and no facility entered into a Voluntary Compliance Agreement.

- Stormwater Facility Inspections: While inspecting a business for source control BMPs, the flow control and/or treatment facility is also inspected. Within the LDW and EWW basins, 61 facilities were inspected for Code compliance with regard to flow control and treatment system code requirements during 2015.

- Illicit Discharge Detection and Elimination (IDDE): SPU conducts sediment sampling of onsite catch basins, right of way catch basins and drainage system mainlines to identify sources of contamination and potential illicit discharges and illicit connections. Sampling is conducted in tandem with business inspections to identify and terminate sources of pollution. Samples are analyzed for the LDW contaminants of concern, including TOC, SVOC's, TPH-Dx, select Metals, PCB's, Grain Size and occasionally site specific parameters, such as pH, additional metals, VOCs.

- Water Quality Complaints: Inspectors respond to complaints as they are received through the water quality hotline, webpage or from agency referrals. In 2015, 73 water quality complaints were reported in the LDW and EWW basins that resulted in12 business inspections. When a complaint is reported at a business, a full business inspection is completed. Spill Response: Spills are dispatched through the SPU Operations Response Center to on-call Spill Coordinators as they are received. In 2015, SPU responded to 69 spills within the LDW and EWW basins.

- Education and Outreach: SPU funds the Resource Venture, a conservation service for Seattle businesses. Resource Venture implements the City's Spill Kit Incentive Program, which provides free spill kits, assistance in developing spill plan and site specific technical assistance to Seattle businesses. Approximately 48 businesses in the LDW and EWW basins received spill kits, either stemming from a business inspection or through targeted outreach. Surveys conducted of spill kit recipients

statistically show that businesses who participate in this program show an improved understanding of stormwater pollution prevention.

- Line Cleaning: In 2015, 22,564 linear feet of storm drainage lines were cleaned in the Highland Park Way and S Nevada St. MS4 basins.

- Source Tracing: In 2015 the Norfolk CSO/PS17 EOF/SD Basin was identified for continued focused source tracing efforts. SPU has found and eliminated several pollutant sources in the Norfolk Basin, but some samples with elevated polycyclic aromatic hydrocarbons (PAH's) persist. In an effort to trace the source of PAH contamination, a focused inspection and sampling effort was initiated by SPU Source Control inspectors during the summer of 2015.

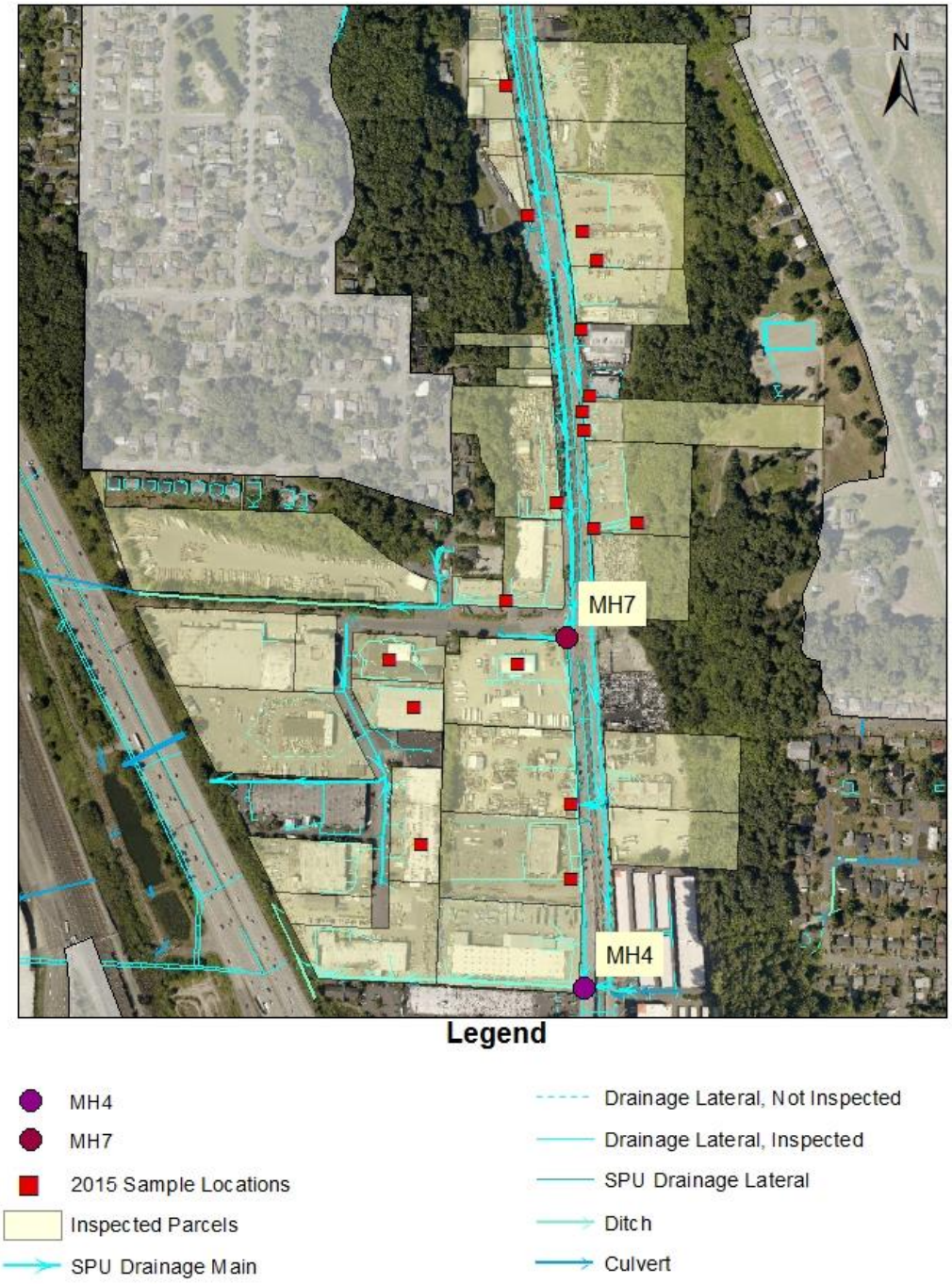
    - Sediment samples collected during periodic business inspections and from routine line sediment monitoring have indicated several locations where levels of heavy polycyclic aromatic hydrocarbons (HPAHs) have exceeded source tracing criteria. Most significantly, sampling conducted on MH7 (see map) located at the intersection of Martin Luther King Jr Way S and S Norfolk St was found to contain levels of HPAHs at 20,650 ppm. Downstream of this maintenance hole, a higher level of HPAHs (37,790 ppm) was found in MH4, located at the southeast corner of 10023 Martin Luther King Jr Way S. The Norfolk Basin includes a ten block industrial section of Southeast Seattle. This area includes approximately thirty businesses, with the primary industries being construction services and transportation.

    - Twenty four businesses were inspected as part of the source tracing efforts. The inspections included a routine assessment of stormwater BMP compliance with a specific focus on potential HPAH sources. Many locations had potential as HPAH sources, as these chemicals are common with businesses dealing with combustion of oils, oil based product uses, and transportation. SPU collected sample(s) at each site where feasible to assess for contaminants. The sediment samples collected were tested using the standard Duwamish parameters of PCBs, Metals (arsenic, copper, lead, mercury, and zinc), semi-volatile organic compounds (SVOCs), total organic carbon (TOC), total petroleum hydrocarbons, and grain size. Several businesses in the basin were not inspected during the source tracing effort, as they had been inspected within the prior year; however, attempts were made to collect samples from their drainage infrastructure. Several locations were unable to be sampled, due to lack of sediment in their infrastructure. In total, eighteen samples were collected within the sub-area. The samples were analyzed by Analytical Resources, Inc., a contract lab in Tukwila, Washington.

    - SPU has validated results for five sediment samples and chemicals of interest were detected, including metals (copper and zinc), SVOCs including phthalates, and total petroleum hydrocarbons (see Table 1). However, PAHs

were not detected at elevated levels in these samples. Total petroleum hydrocarbons, zinc, and phthalates were detected at sample location CB193, which was collected from a construction lay down yard. SPU inspectors issued a correction action letter to the site to implement necessary Best Management Practices and the site has complied. The remaining sampling results are currently undergoing validation, and thus cannot be reported on at this time. Once the data is validated, SPU will address any additional contaminant issues through follow up inspections, drainage system cleaning, and enforcement actions.

- SPU Source Control is actively monitoring this sub-area and will be conducting follow up sampling of MH4 and MH7 as sediment accumulates in the system. This will indicate if the PAH issue is historic or ongoing in this drainage basin. The basin will continue to be regularly inspected per the SPU Source Control compliance inspection frequencies, and increased focus on HPAH sources will occur. If contamination is found, SPU will continue source tracing efforts.



Map of Norfolk source tracing

Table 1. SEDIMENT SAMPLE RESULTS FOR NORFOLK SOURCE TRACING

					Location	CB189		CB193		CB195		CB196		CB233	
					Sample Name	CB189-042315		CB193-062215		CB195-062215		CB196-062215		CB233-052715	
					Sample Date	23 Apr 2015		22 Jun 2015		22 Jun 2015		22 Jun 2015		27 May 2015	
					Location Type	CB		CB		CB		CB		CB	
					Project	Lower Duwamish Waterway		Lower Duwamish Waterway		Lower Duwamish Waterway		Lower Duwamish Waterway		Lower Duwamish Waterway	
					Outfall	S Norfolk St CSO/PS17 EOF/SD		S Norfolk St CSO/PS17 EOF/SD		S Norfolk St CSO/PS17 EOF/SD		S Norfolk St CSO/PS17 EOF/SD		S Norfolk St CSO/PS17 EOF/SD	
CHEMICAL NAME	METHOD ANALYTE GROUP	RESULT UNIT	SQS/LAET[a]	CSL/2LAET[b]											
Solids, Total	1 Solids_TOC	%			45.87		43.05		25.86		76.97		49.74		
Total Organic Carbon	1 Solids_TOC	%			4.62	J	5.1		5.06		1.57		4.61		
Arsenic	2 Metals	mg/kg	57	93	2.8		30		20		12		10	U	
Copper	2 Metals	mg/kg	*390*	**390**	***643***		171		96.1		27.4		120		
Lead	2 Metals	mg/kg	450	530	40		42		81		34		56		
Mercury	2 Metals	mg/kg	0.41	0.59	0.12		0.1		0.2		0.11		0.06		
Zinc	2 Metals	mg/kg	*410*	**960**	*593*		***1160***		***1810***		79		*441*		
Diesel Range Hydrocarbons	3 TPH	mg/kg	*2000*	**2000**	1200		***9500***		280		68		1000		
Motor Oil Range	3 TPH	mg/kg	*2000*	**2000**	***4400***		***16000***		1900		140		***3800***		
Acenaphthene	4 LPAH	ug/kg	*500*	**500**	110	U	230	U	120	U	19	U	39	J	
Acenaphthylene	4 LPAH	ug/kg	1300	1300	110	U	230	U	120	U	19	U	110	U	
Anthracene	4 LPAH	ug/kg	960	960	110	U	230	U	35	J	16	J	66	J	
Fluorene	4 LPAH	ug/kg	*540*	**540**	110	U	230	U	120	U	19	U	44	J	
LPAH	4 LPAH	ug/kg	5200	5200	166	J	390	J	418	J	69.8	J			
Naphthalene	4 LPAH	ug/kg	2100	2100	46	J	70	J	93	J	6.8	J	100	J	
Phenanthrene	4 LPAH	ug/kg	1500	1500	120		320		290		47		450		
Benzo(A)anthracene	5 HPAH	ug/kg	1300	1600	63	J	100	J	160		59		160		
Benzo(A)pyrene	5 HPAH	ug/kg	1600	1600	68	J	230	U	200		63		140		
Benzo(G,H,I)perylene	5 HPAH	ug/kg	*670*	**720**	220		220	J	240		51		150		
Benzofluoranthenes, Total	5 HPAH	ug/kg	3200	3600	170	J	350	J	540		140		440		
Chrysene	5 HPAH	ug/kg	1400	2800	160		400		340		95		540		
Dibenzo(A,H)anthracene	5 HPAH	ug/kg	*230*	**230**	110	U	***230***	***U***	41	J	14	J	110	U	
Fluoranthene	5 HPAH	ug/kg	*1700*	2500	150		370		420		150		530		
HPAH	5 HPAH	ug/kg	12000	17000	1124	J	1870	J	2541	J	756	J			
Indeno(1,2,3-Cd)pyrene	5 HPAH	ug/kg	*600*	690	63	J	230	U	150		44		100	J	
Pyrene	5 HPAH	ug/kg	2600	3300	230		430		450		140		600		
Bis(2-ethylhexyl)phthalate	6 Phthalates	ug/kg	*1300*	**1900**	***6500***		***74000***		***5400***		150		***11000***		
Butylbenzylphthalate	6 Phthalates	ug/kg	*63*	**900**	*110*	*U*	*230*	*U*	*180*		16	J	***1600***		
Diethylphthalate	6 Phthalates	ug/kg	*200*	1200	110	U	*230*	*U*	120	U	35		110	U	
Dimethylphthalate	6 Phthalates	ug/kg	*71*	**160**	*110*	*U*	***230***	***U***	*120*	*U*	19	U	*110*	*U*	
Di-N-Butylphthalate	6 Phthalates	ug/kg	1400	1400	510		610		76	J	19	U	290		
Di-N-Octylphthalate	6 Phthalates	ug/kg	*6200*	**6200**	110	U	1200		430		19	U	***8100***		
Aroclor 1016	7 PCBs	ug/kg			18	U	19	U	19	U	19	U	19	UJ	
Aroclor 1221	7 PCBs	ug/kg			18	U	19	U	19	U	19	U	19	UJ	
Aroclor 1232	7 PCBs	ug/kg			18	U	19	U	19	U	19	U	19	UJ	
Aroclor 1242	7 PCBs	ug/kg			18	U	19	U	19	U	19	U	19	UJ	
Aroclor 1248	7 PCBs	ug/kg			18	U	19	U	19	U	19	U	19	U	
Aroclor 1254	7 PCBs	ug/kg			42		29	U	48	J	57		11	J	
Aroclor 1260	7 PCBs	ug/kg			44		24	U	34		22		19	U	
Polychlorinated Biphenyls	7 PCBs	ug/kg	*130*	1000	86		29	U	82	J	79				
1,2,4-Trichlorobenzene	8 Other Organic Compounds	ug/kg	*31*	**51**	***110***	***U***	***230***	***U***	***120***	***U***	19	U	***110***	***U***	
1,2-Dichlorobenzene	8 Other Organic Compounds	ug/kg	*35*	**50**	***110***	***U***	***230***	***U***	***120***	***U***	19	U	***110***	***U***	
1,3-Dichlorobenzene	8 Other Organic Compounds	ug/kg			110	U	230	U	120	U	19	U	110	U	
1,4-Dichlorobenzene	8 Other Organic Compounds	ug/kg	*110*	**110**	***110***	***U***	***230***	***U***	***120***	***U***	19	U	***110***	***U***	
1-Methylnaphthalene	8 Other Organic Compounds	ug/kg			110	U	230	U	120	U	19	U	44	J	
2,2'-Oxybis(1-chloropropane)	8 Other Organic Compounds	ug/kg			110	U	230	UJ	120	UJ	19	UJ	110	U	
2,4,5-Trichlorophenol	8 Other Organic Compounds	ug/kg			570	U	1200	U	580	U	97	U	560	U	
2,4,6-Trichlorophenol	8 Other Organic Compounds	ug/kg			570	U	1200	U	580	U	97	U	560	U	
2,4-Dichlorophenol	8 Other Organic Compounds	ug/kg			570	U	1200	U	580	U	97	U	560	U	
2,4-Dimethylphenol	8 Other Organic Compounds	ug/kg	*29*	**29**	***570***	***U***	***1200***	***U***	***580***	***U***	***97***	***U***	***560***	***U***	
2,4-Dinitrophenol	8 Other Organic Compounds	ug/kg			1100	U	2300	U	1200	U	190	U	1100	U	

					Location	CB189		CB193		CB195		CB196		CB233	
					Sample Name	CB189-042315		CB193-062215		CB195-062215		CB196-062215		CB233-052715	
					Sample Date	23 Apr 2015		22 Jun 2015		22 Jun 2015		22 Jun 2015		27 May 2015	
					Location Type	CB		CB		CB		CB		CB	
					Project	Lower Duwamish Waterway		Lower Duwamish Waterway		Lower Duwamish Waterway		Lower Duwamish Waterway		Lower Duwamish Waterway	
					Outfall	S Norfolk St CSO/PS17 EOF/SD		S Norfolk St CSO/PS17 EOF/SD		S Norfolk St CSO/PS17 EOF/SD		S Norfolk St CSO/PS17 EOF/SD		S Norfolk St CSO/PS17 EOF/SD	
CHEMICAL NAME	METHOD ANALYTE GROUP	RESULT UNIT	SQS/LAET[a]	CSL/2LAET[b]											
2,4-Dinitrotoluene	8 Other Organic Compounds	ug/kg			570	U	1200	U	580	U	97	U	560	U
2,6-Dinitrotoluene	8 Other Organic Compounds	ug/kg			570	U	1200	U	580	U	97	U	560	U
2-Chloronaphthalene	8 Other Organic Compounds	ug/kg			110	U	230	U	120	U	19	U	110	U
2-Chlorophenol	8 Other Organic Compounds	ug/kg			110	U	230	U	120	U	19	U	110	U
2-Methylnaphthalene	8 Other Organic Compounds	ug/kg	670	670	110	U	230	U	47	J	9.7	J	78	J
2-Methylphenol	8 Other Organic Compounds	ug/kg	*63*	**63**	***110***	***U***	***230***	***U***	***120***	***U***	9.7	J	***110***	***U***
2-Nitroaniline	8 Other Organic Compounds	ug/kg			570	U	1200	U	580	U	97	U	560	U
2-Nitrophenol	8 Other Organic Compounds	ug/kg			110	U	230	U	120	U	19	U	110	U
3,3`-Dichlorobenzidine	8 Other Organic Compounds	ug/kg			570	UJ	1200	U	580	U	97	U	560	U
3-Nitroaniline	8 Other Organic Compounds	ug/kg			570	U	1200	U	580	U	97	U	560	U
4,6-Dinitro-2-Methylphenol	8 Other Organic Compounds	ug/kg			1100	U	2300	U	1200	U	190	U	1100	U
4-Bromophenyl phenyl ether	8 Other Organic Compounds	ug/kg			110	U	230	U	120	U	19	U	110	U
4-Chloro-3-Methylphenol	8 Other Organic Compounds	ug/kg			570	U	1200	U	580	U	97	U	560	U
4-Chloroaniline	8 Other Organic Compounds	ug/kg			570	U	1200	U	580	U	97	U	560	U
4-Chlorophenyl Phenylether	8 Other Organic Compounds	ug/kg			110	U	230	U	120	U	19	U	110	U
4-Methylphenol	8 Other Organic Compounds	ug/kg	*670*	**670**	350		***4600***		220		23		180	
4-Nitroaniline	8 Other Organic Compounds	ug/kg			570	U	1200	U	580	U	97	U	560	U
4-Nitrophenol	8 Other Organic Compounds	ug/kg			570	U	1200	U	580	U	97	U	560	U
Benzoic acid	8 Other Organic Compounds	ug/kg	*650*	**650**	***2600***		***2300***	***U***	***2000***		590		***1500***	
Benzyl alcohol	8 Other Organic Compounds	ug/kg	*57*	**73**	***470***		***430***		***1000***		***190***		***110***	***R***
bis(2-Chloroethoxy) methane	8 Other Organic Compounds	ug/kg			110	UJ	230	U	120	U	19	U	110	U
Bis-(2-chloroethyl) ether	8 Other Organic Compounds	ug/kg			110	UJ	230	U	120	U	19	U	110	U
Carbazole	8 Other Organic Compounds	ug/kg			110	U	230	U	120	U	9.7	J	110	U
Dibenzofuran	8 Other Organic Compounds	ug/kg	*540*	**540**	110	U	230	U	47	J	19	U	110	U
Hexachlorobenzene	8 Other Organic Compounds	ug/kg	*22*	**70**	***110***	***U***	***230***	***U***	***120***	***U***	19	U	***110***	***U***
Hexachlorobutadiene	8 Other Organic Compounds	ug/kg	*11*	**120**	*110*	*U*	***230***	***U***	***120***	***U***	*19*	*U*	*110*	*U*
Hexachlorocyclopentadiene	8 Other Organic Compounds	ug/kg			570	U	1200	U	580	U	97	U	560	U
Hexachloroethane	8 Other Organic Compounds	ug/kg			110	U	230	U	120	U	19	U	110	U
Isophorone	8 Other Organic Compounds	ug/kg			110	U	230	U	120	U	19	U	110	U
Nitrobenzene	8 Other Organic Compounds	ug/kg			110	U	230	U	120	U	19	U	110	U
N-Nitroso-Di-N-Propylamine	8 Other Organic Compounds	ug/kg			110	UJ	230	U	120	U	19	U	110	U
N-Nitrosodiphenylamine	8 Other Organic Compounds	ug/kg	*28*	**40**	***110***	***UJ***	***230***	***U***	***120***	***U***	19	U	***110***	***U***
Pentachlorophenol	8 Other Organic Compounds	ug/kg	*360*	**690**	*570*	*U*	***1200***	***U***	*580*	*U*	31	J	*560*	*U*
Phenol	8 Other Organic Compounds	ug/kg	*420*	1200	*450*		*450*		260		30		220	
>10 Phi Clay	9 Grain Size	%			0.4								11.2	
8-9 Phi Clay	9 Grain Size	%			1.1								0.4	
9-10 Phi Clay	9 Grain Size	%			0.5								0.1	U
Coarse Sand	9 Grain Size	%			4		5.9		0.3		28		10.6	
Coarse Silt	9 Grain Size	%			26.6								7.3	
Fine Gravel	9 Grain Size	%					9.2		0.1	U	18.2			
Fine Sand	9 Grain Size	%			13.7		7.9		2.5		4		26.3	
Fine Silt	9 Grain Size	%			8.1								3.1	
Gravel	9 Grain Size	%			2.5		2.4		0.3		9.1		0.1	U
Medium Sand	9 Grain Size	%			7		11.6		1.4		20.8		12.3	
Medium Silt	9 Grain Size	%			16.1								4	
Total Fines	9 Grain Size	%			56.1									
Very Coarse Sand	9 Grain Size	%			3		3.1		0.3		7.7		2.6	
Very Fine Sand	9 Grain Size	%			13.8		8.1		1.7		2.6		11	
Very Fine Silt	9 Grain Size	%			3.2								1.5	

a. SQS/LAET = Sediment Quality Standards in the Sediment Management Standards, Chemical Criteria for Puget Sound Marine Sediments
b. CSL/2LAET = Cleanup Screening Level in the Sediment Management Standards for Chemical Criteria for Puget Sound Marine Sediments