

Lower Duwamish Waterway Group

Port of Seattle / City of Seattle / King County / The Boeing Company

BASELINE SURFACE WATER COLLECTION AND CHEMICAL ANALYSES – QUALITY ASSURANCE PROJECT PLAN – ADDENDUM

FINAL

Prepared for

Lower Duwamish Waterway Group

For submittal to


US Environmental Protection Agency


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Title and Approval Page
Surface Water Collection and Chemical Analyses
Quality Assurance Project Plan

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Acronyms

AOC	Administrative Order on Consent
BEHP	bis(2-ethylhexyl)phthalate
Cfs	cubic feet per second
DQO	data quality objective
EPA	US Environmental Protection Agency
ID	identification
LDW	Lower Duwamish Waterway
NOAA	National Oceanic and Atmospheric Administration
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
QA	quality assurance
QAPP	quality assurance project plan
TBT	tributyltin
USGS	US Geological Survey

1 Introduction

This quality assurance project plan (QAPP) addendum describes changes to the EPA-approved surface water QAPP (Windward 2017), which describes quality assurance (QA) objectives, methods, and procedures for collecting surface water from the Lower Duwamish Waterway (LDW) for chemical analyses. These changes are being made based on a comment letter from the US Environmental Protection Agency (EPA) dated January 11, 2018 and on comments received from EPA on February 28, 2018.

As described in the *Pre-Design Studies Work Plan* (Windward and Integral 2017), hereafter referred to as the Work Plan, and the surface water QAPP (Windward 2017), baseline surface water data are being collected and analyzed to address the third amendment to the Administrative Order on Consent (AOC) (EPA 2016). The Work Plan presented the data quality objectives (DQOs) and conceptual study design for surface water collection and associated chemical analyses (Windward and Integral 2017). The QAPP included these DQOs and presented the detailed surface water study design, including details on project organization, field data collection, laboratory analyses, and data management (Windward 2017). This addendum describes the changes to the QAPP, which are associated only with storm sampling event 3 (Storm 3). In addition, this addendum documents changes to the analyte list, as were approved by EPA and documented in the *Surface Water Analyte Evaluation* memorandum dated January 25, 2018 (Windward 2018). All other elements of the QAPP remain unchanged.

2 Changes Associated with Data Generation and Acquisition

Changes to the collection conditions of surface water composite-grab samples are described in this section. There are no changes to sampling locations, depths, compositing procedures, processing practices, or analysis methods for any of the sampling events. The only change to the QAPP is a change in targeted conditions for Storm 3; these conditions were described in QAPP Section 4.1.1.3 and summarized in QAPP Table 4-3.

2.1 CHANGES TO STORM 3 SAMPLING CONDITIONS

Key sampling conditions for the revised Storm 3 are summarized as follows:

- u **Targeted storm rainfall** – Sampling will target a storm with ≥ 0.25 in. of rain forecasted in a 24-hour period with a 48-hour antecedent period without heavy rainfall (i.e., < 0.2 in.).
- u **Timing of sampling** – Sampling will be timed to be initiated and completed within a 12-hour window that includes the period of peak intensity predicted during the identified 24-hour storm period. National Oceanic and Atmospheric Administration (NOAA) forecasts and real-time information from the Doppler radar system (also available on the NOAA website) as the storm approaches will be considered in sample collection timing, which, for safety reasons, must take place during daylight hours.
- u **Dam release conditions** – Sampling will be conducted during a period without significant dam releases (i.e., $< 2,000$ cubic feet per second [cfs]).

Table 2-1 presents an update of the relevant row of Table 4-3 in QAPP, to reflect changes to the Storm 3 sampling event.

Table 2-1. Revised Storm 3 sampling conditions

Sampling Event	Event (ID)	Forecasted Precipitation ^a	Targeted Dam Release Conditions ^b	Target Schedule
Original Storm 3 (old definition)	ST3	≥ 0.25 in. in 24-hour period Samples will generally be collected within 12 hours of the period during a storm that is predicted to have the greatest amount of rainfall.	with significant dam release (> 2,000 cfs)	November 2017 to January 2018
Revised Storm 3 ^c (new definition)	Revised ST3	≥ 0.25 in. in 24-hour period with 48-hour antecedent period (immediately preceding the 24-hour storm period) without heavy rainfall ^d	without significant dam release (< 2,000 cfs)	February to June 2018

^a Forecasted precipitation will be based on local rainfall projections from the NOAA weather website. The Doppler radar system (also available on the NOAA website) will also be used to help inform sample timing. Rainfall during the 48-hour antecedent period (immediately preceding the 24-hour storm period) will be based on measurements taken at the Hamm Creek gage (HAU2).

^b Dam releases will be as measured at the USGS gage just below the Howard Hanson Dam (Gauge 12105900).

^c Sampling shall be started and completed during the targeted 24-hour storm and during the forecasted 12-hour window that includes the predicted period of peak rainfall intensity. Sample collection takes approximately four hours. To capture initial runoff, sample collection will, to the extent possible, overlap with or encompass the forecasted period of peak rainfall intensity, rather than starting after it has passed.

^d During the antecedent 48-hour period, up to approximately 0.2 in. of precipitation will be considered acceptable.

cfs – cubic feet per second
ID – identification

NOAA – National Oceanic and Atmospheric Administration
USGS – US Geological Survey

2.2 SAMPLE ANALYSIS AND PROCESSING

Analytes for the remaining surface water sampling events (i.e., ST3, ST4, WB1, WB2, and DB2) have been modified (as defined in Table 2-2), consistent with the approved *Surface Water Analyte Evaluation* memorandum (Windward 2018). Samples will be processed, analyzed, and validated according to the methods described in the QAPP, and the data will be reported consistently with the reporting requirements specified in the QAPP.

Table 2-2. Summary of analytes for surface water sampling events

Analyte	Baseline Surface Water Sampling Events							
	DB1	ST1	ST2	ST3	ST4	WB1	WB2	DB2
Metals and organometals	X	X	X	all metals (including mercury)	all metals (including mercury)	copper, inorganic arsenic	copper, inorganic arsenic	copper, inorganic arsenic
PAHs	X	X	X	X	X	X	X	X
Phthalates	X	X	X	BEHP	BEHP	BEHP	BEHP	BEHP
Other SVOCs	X	X	X	-	-	-	-	-
PCBs	X	X	X	X	X	X	X	X
Organochlorine pesticides	X	X	X	-	-	-	-	-
Dioxins/furans	X	X	X	-	-	-	-	-

Analyte	Baseline Surface Water Sampling Events							
	DB1	ST1	ST2	ST3	ST4	WB1	WB2	DB2
Organophosphate pesticides and carbaryl	-	X	-	-	-	-	-	-

Note: An X indicates that an analyte will be analyzed in samples for a given baseline surface water sampling event.

BEHP – bis(2-ethylhexyl)phthalate

QAPP – quality assurance project plan

DB – dry baseflow

ST – storm

PAH – polycyclic aromatic hydrocarbon

SVOC – semivolatile organic compound

PCB – polychlorinated biphenyl

WB – wet baseflow

3 References

- EPA. 2016. Third Amendment to the Administrative Order on Consent for remedial investigation/feasibility study (AOC) for the Lower Duwamish Waterway (LDW), CERCLA-10-2001-0055. US Environmental Protection Agency, Region 10, Olympia, WA.
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