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FINAL STORMWATER SOURCE CONTROL EVALUATION REPORT

Terminal 4 Slip 1

Prepared for

Port of Portland
11040 N Lombard Street
Portland, OR 97203

Prepared by

Geosyntec Consultants, Inc.
920 SW Sixth Ave, Suite 600
Portland, OR 97204

Project PNW0524C

June 2024

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ACRONYMS AND ABBREVIATIONS

BEHP	Bis(2-ethylhexyl)phthalate
BES	City of Portland Bureau of Environmental Services
BMP	Best Management Practice
City CPD	City of Portland Commission of Public Docks
COI	Contaminant of Interest
DDx	Dichlorodiphenyldichloro compounds, including DDT, DDE, and DDD
DEQ	Oregon Department of Environmental Quality
DMR	Discharge Monitoring Report
ECSI	Environmental Cleanup Site Information
EPA	U.S. Environmental Protection Agency
Geosyntec	Geosyntec Consultants, Inc.
JSCS	Joint Source Control Strategy
KM	Kinder Morgan Bulk Terminals, Inc.
MFA	Maul Foster & Alongi, Inc.
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS4	Municipal Separate Storm Sewer System
PAHs	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyl
PHSS	Portland Harbor Superfund Site
Port	Port of Portland
PTW	Principal Threat Waste
RCRA	Resource Conservation and Recovery Act
RAL	Remedial Action Level
RI	Remedial Investigation
RD	Remedial Design
ROD	Record of Decision
SCE	Source Control Evaluation
SCM	Source Control Measure
SER	Stormwater Evaluation Report
SLV	Screening Level Value
SMA	Sediment Management Area
SW	Stormwater
SWPCP	Stormwater Pollution Control Plan
T4	Terminal 4
TAPE	Technology Assessment Protocol - Ecology
Toyota	Toyota Motors USA, Inc.
TSS	Total Suspended Solids
UPRR	Union Pacific Railroad
VCP	Voluntary Cleanup Program

1. INTRODUCTION

1.1 Purpose

This report presents the results of a stormwater Source Control Evaluation (SCE) for the Port of Portland's (Port's) Terminal 4 (T4) Slip 1 Upland Facility (Site; ECSI No. 2356). The Site is located at 11040 N Lombard St in Portland, Oregon, and is within the boundary of the Portland Harbor Superfund Site (PHSS). Slip 1 is a channel inlet off the main Willamette River. Stormwater outfalls at the Site discharge to Slip 1, Wheeler Bay, or directly to the river.

This report presents and evaluates the observations documented during 2020-2024 (evaluation period) by stormwater basin, in accordance with Oregon Department of Environmental Quality's (DEQ's) *Guidance for Evaluating the Stormwater Pathway at Upland Sites* (DEQ, 2009). Findings and conclusions from historical reports (pre-2020) are also included where relevant.

1.2 Source Control Objective

The objective of this SCE is to demonstrate that existing and potential sources of contamination at the Site have been addressed and no additional stormwater characterization or source control measures (SCMs) are needed at the Site.

1.3 Regulatory Framework

This stormwater SCE has been completed pursuant to the following agreement with DEQ:

Terminal 4 Slip 1 Upland Facility – Voluntary Agreement for Remedial Investigation, Source Control Measures, and Feasibility Study (DEQ No. LQVC-NWR-03-18), December 4, 2003.

1.4 Report Organization

This report follows DEQ's Template for a Stormwater Source Control Evaluation Report, which is Appendix C of DEQ's Guidance for Evaluating the Stormwater Pathway at Upland Sites (DEQ, 2017).

- Section 1 introduces the purpose and objectives of this stormwater SCE report
- Section 2 presents a description of the Site, land uses, and previous investigations
- Section 3 describes the Site's potential sources of contaminants of interest (COIs)
- Section 4 presents ongoing management measures at the Site
- Section 5 summarizes recent data and observations
- Section 6 describes SCMs relevant to current-day conditions at the Site

- Section 7 evaluates existing information to determine the source control status of each drainage basin in Slip 3
- Section 8 presents the conclusions of this SCE
- Section 9 provides citations for documents referenced by this report

2. SITE BACKGROUND

2.1 Site Description

T4 occupies approximately 260 acres on the east bank of the lower Willamette River downstream from the St. Johns Bridge in north Portland, Oregon, between River Miles 4.2 and 5.5 (Figure 1). The land is zoned for industrial use. Surrounding areas are occupied by marine, industrial, and commercial operations, with a small residential zone of four tax lots located 200 feet east of the terminal.

The topography of T4 consists primarily of relatively flat areas close to the Willamette River with a steep hillside and bluff located on the east side of the Site. Lower portions of the Site are located approximately 35 feet above mean sea level (NAVD88 datum), while eastern portions of the terminal near Lombard Street are at an elevation of approximately 100 feet. The river water surface elevation is typically less than 10 feet, with a mean tidal range of about 2 feet. Depth to groundwater in the low-lying area of the site is around 15 to 20 feet. The land cover at T4 is a mixture of pervious open space, rail tracks, industrial buildings, and asphalt and concrete pavement.

For the purposes of DEQ oversight the T4 upland area was divided into three sections: Terminal 4 Slip 1 (ECSI No. 2356), Terminal 4 Slip 3 (ECSI No. 272), and the Terminal 4 Auto Storage Area (ECSI No. 172). These areas encompass approximately 98 acres, 27 acres, and 102 acres, respectively. This stormwater SCE is for the T4 Slip 1 Upland Facility.

Slip 1 is located at the northern end of the terminal and is bounded by Schnitzer Steel Products and Northwest Pipe Company on the north, N. Lombard Street and the Union Pacific Railroad right-of-way on the east, the T4 Slip 3 Upland Facility on the south, and the ordinary high water line of the Willamette River at Slip 1 on the west. The Port also owns submerged lands below ordinary high water located in Slip 1.

Three water-related areas within or near T4 Slip 1 are:

- Berth 401 – This is an active berth in the main river north (downstream) of Slip 1.
- Slip 1 – This has no existing water-dependent uses, and future uses are planned to be limited to barge use. Slip 1 contains two piers (Pier 1 and Pier 2) and three berths (405, 408, and 409).
- Wheeler Bay – This is an inactive bay with no current water-dependent uses and no anticipated future uses.

2.2 Stormwater Conveyance System

Nearly all stormwater at the Site either infiltrates or reaches a conveyance system via overland flow and then discharges to the river through an outfall. The Site's stormwater conveyance system is shown in Figure 2.

2.2.1 Drainage Basins

T4 Slip 1 is divided into eight stormwater subbasins of various sizes and drainage characteristics (Table 1). Basin L is the southernmost basin at T4 Slip 1 which discharges to Wheeler Bay; Basins M, N, O, P, and Q are located north of Basin L and discharge to Slip 1; Basins R and S are located at the northern edge of Slip 1 and discharge to the Willamette River near Berth 401. A City of Portland-owned outfall, OF52C, also discharges to Slip 1 though is not discussed in this report as no stormwater from T4 Slip 1 discharges to this outfall.

Portions of the stormwater drainage area are not conveyed to outfalls, but instead are self-contained via secondary containment walls resulting in infiltration and evaporation, or are diverted to sanitary (Figure 3).

Table 1. T4 Slip 1 Upland Facility Drainage Basins

Drainage Basin	Total Area (ac)	Approximate Percent Impervious
L	11.1	71
M	26.5	53
N	3.6	30
O	4.8	61
P	0.8	42
Q	20.4	26
R	7.0	33
S	9.7	27
Total	*83.9*	*44*

2.2.2 Outfalls

There are nine active outfalls discharging from the Slip 1 upland facility (Figure 2, Table 2). Each drainage basin is associated with a single outfall, with the exception of Basin P, which consists of two catch basins which both discharge to Slip 1 through their own pipe.

The storm lines for Basins O, N, and S were videoed in 2021-2022 to verify connectivity and completion of storm line cleanouts in those basins. In Basin N, trench drains previously thought to drain to the storm system were found to drain to the sanitary system. In Basin S, the main pipe was found to be corroded and compromised; the pipe was replaced as described in Section 6.

Table 2. Current Status of T4 Slip 1 Outfalls

Drainage Basin	Port Asset ID	Outfall Location	Status
L	STSOUT267	Wheeler Bay	Active
M	STSOUT251	South side of Slip 1	Active
N	STSOUT252	Head of Slip 1	Active
O	STSOUT253	Head of Slip 1	Active
P	STSCB6061	Head of Slip 1	Active
	STSCB6062	Head of Slip 1	Active
Q	STSOUT254	Head of Slip 1	Active
R	STSOUT1038	Willamette River near Berth 401	Active
S	STSOUT256	Willamette River near Berth 401	Active

2.3 Site Ownership and Operating History

An exhaustive description of Site ownership and historical land uses by stormwater basin was provided in the 2019 Stormwater Source Control Evaluation Work Plan (2019 Work Plan; Geosyntec, 2019). Additional information is available there, as well as the T4 Slip 1 Remedial Investigation Proposal (URS, 2004).

Initial development of T4 began in 1907 by the Union Pacific Railroad (UPRR) for an oil supply dock; the Site was then purchased in 1917 by the City of Portland Commission of Public Docks (City CPD). Construction was completed in 1919. The U.S. Army operated the terminal in the 1940s to serve as a port of embarkation and supply depot to support World War II. The Port of Portland (Port) acquired the terminal from the City CPD in 1971 and is the current owner of the Site. However, portions of the Site have been leased to various tenants since the early 1900s.

Historical operations at T4 as a whole have included loading, unloading, processing, and storage of grain; cold storage; fumigation of cotton and food products; liquid storage (*e.g.*, fertilizer, molasses, tallow, urea, caustic soda, petroleum products, and fats); container food freight; a gasoline station; a salvage yard; operation of a break-bulk berth; a fire boat moorage; importation of ore and ore concentrates, including alumina, bauxite, chromite, chrome ore, coal, copper ores/concentrates, ferro-phosphorous iron ore, manganese, lead concentrate, sulfur, tricaphos, and zinc; and importation of other products, including pencil pitch, soda ash, talc, bentonite clay, coal, coke, and live sheep (Ash Creek Associates, 2009). Handling of pencil pitch was discontinued in 1998 (DEQ, 2003).

T4 is currently used as a marine facility. Operations at the Site consist of ship and rail loading/unloading; bulk cargo, liquid, and grain handling and storage; and general equipment and operational maintenance. Portions of T4 Slip 1 are currently leased out to tenants Kinder Morgan

Bulk Terminals, Inc. (KM) for handling soda ash, International Raw Materials LLC (IRM) for handling liquid bulk materials, and Grain Craft for processing and shipment of grains (Figure 3).

In general, these current cargos do not include chemicals that are COIs in Portland Harbor sediments and are contained in such a manner that they have low risk of release. In addition, the cargo loading, unloading, and handling are conducted in accordance with Best Management Practices (BMPs) to reduce the risk of releases to the river.

Land uses at the Site have not substantially changed since the Site's original stormwater work plan was created in 2007 (2007 SW Work Plan; Ash Creek Associates, Inc./Newfields, 2007a).

2.4 Regulatory History

For the Slip 1 upland area, the Port entered into a Voluntary Cleanup Program (VCP) Agreement for Feasibility Study and Source Control Measures on December 4, 2003 (LQVC-NWR- 03-18). The bulk of the regulatory history at the Site is related to this VCP.

Stormwater discharges from T4 are permitted under the Port's Municipal Separate Storm Sewer System (MS4) Discharge Permit No. 101314 (for property and infrastructure owned by the Port), and KM's 1200-Z Industrial Stormwater Permit Facility No. 100025 (for infrastructure on KM's leasehold). KM also holds an industrial pretreatment permit issued by the City of Portland Bureau of Environmental Services (BES) for direct discharge of treated process and industrial exposure water to the sanitary system. KM is responsible for legal compliance under their operating agreements, including operational permits, implementation of a Spill Response Plan and a Stormwater Pollution Control Plan (SWPCP), and compliance with the Port's MS4 Discharge Permit. These permits authorize the release of stormwater to the river subject to specified terms and conditions and require the implementation of stormwater BMPs. As part of their SWPCP, KM is required to collect samples and provide discharge monitoring reports (DMRs) to BES as DEQ's authorized agent.

The Port currently has no regulated tanks at T4, and no current activities that qualify for Resource Conservation and Recovery Act (RCRA) generator status. From historical activities, Terminal 4 qualified for reporting (EPA ID number ORD981771546).

Additional historical information was summarized as part of the remedial investigation (Ash Creek Associates/Newfields, 2007b).

2.5 Previous Investigations

A comprehensive summary of previous investigations was provided in the 2019 Work Plan (Geosyntec, 2019). For reference purposes, completed milestone documents related to stormwater and stormwater source controls at T4 Slip 1 are as follows:

- Remedial Investigation (Ash Creek Associates/Newfields, 2007b)
- Stormwater Source Control Evaluation (2009 SW SCE; Ash Creek Associates, 2009)
- Source Control Completion Report (Ash Creek Associates, 2011)

- Additional Stormwater Sampling Memo (Ash Creek Associates, 2013)
- Additional Source Control Measures Memo (Apex, 2014)
- Source Control Decision Support Data Collection (Geosyntec and GS&P, 2016)
- Treatment Effectiveness Pilot Study (Geosyntec Consultants, 2018a)
- Soil Infiltration Testing Report (Geosyntec, 2018b)
- Stormwater Quality Assessment Work Plan (2019 Work Plan; Geosyntec, 2019)
- Stormwater Evaluation Report, Terminal 4 Slip 1 (Geosyntec, 2021)
- Stormwater Evaluation Report, Terminal 4 Slip 1 (Geosyntec, 2022a)
- Basin M Vegetated Infiltration Basin Year 1 Annual Summary Report (Geosyntec, 2022b)
- Basin M Vegetated Infiltration Basin Operational Year 2 Comprehensive Report (Geosyntec, 2024)
- Basin L Stormwater Treatment System Performance Verification Report (MFA, 2024)

Additional descriptions of the history of source controls activities and studies performed at the Site were also provided to DEQ in the Terminal 4 Sufficiency Assessment on March 4, 2022 (Anchor QEA et al. 2022).

Prior to 2020, stormwater from four of the Site's eight stormwater basins had been characterized (Basins L, M, Q, and R). Storm solids had also been previously characterized for Basins L, M, and Q, with limited analysis for Basins O and R. However, these storm solids data and much of the stormwater data were collected prior to completion of source control measures, and so are not representative of current conditions (Table 3). Pre-2020 stormwater data that may still be representative of current-day conditions are provided at the end of this report as Appendix A and are compared to data from other Portland Harbor industrial sites using the DEQ-provided rank order curves in Appendix B. Additional stormwater data have been collected in all eight basins since 2020, including data post-installation of new SCMs. These data are also included in Appendix A and Appendix B.

The following subsections present investigative history and results for each of the Slip 1 drainage basins up to 2022. Data are compared to Joint Source Control Strategy (JSCS) Screening Level Values (SLVs) for water for Portland Harbor (DEQ and EPA, 2005) and rank order curves for stormwater developed by DEQ for the stormwater pathway in Portland Harbor (DEQ, 2017). Data collected from 2023-2024, which has not been presented in any previous report, are presented in Sections 5 and 6.

Table 3. Rationale for Data Excluded From This Stormwater Source Control Evaluation for Slip 1 (adapted from Anchor QEA et al., 2022)

Basin	Excluded Data	Rationale	Reference[1]
L	Data obtained before 2022	StormwateRx Aquip unit was added in 2022	1
M	Data obtained before 6/2010	Storm system was cleaned out in 6/2010	2
N	Data obtained before 2022	Storm system was cleaned out in late 2021	3
O	Data obtained before 2023	Additional SCMs were completed in Basin O in early 2023	This report
P	*none*	*N/A*	-
Q	Data from 2008 and earlier	Eight large grain tanks each with a footprint exceeding 20,000 square feet and containing paint with high PCB content were removed in 2008	2
R	Data obtained before 10/2007	Storm system was cleaned out in 10/2007	4
S	*none*	*N/A*	-

[1]1 = MFA, 2024; 2 = Ash Creek Associates, Inc., 2011; 3 = Geosyntec, 2022a; 4 = Ash Creek Associates, Inc., 2009.

2.5.1 Basin L

The current land use for Basin L is soda ash loading operations under KM's leasehold. This land use has not changed since the 2007 SW Work Plan. The delineation of this basin has been modified since 2007 to reflect increased understanding of the contributing drainage area, including:

- removal of areas north of the rail tracks,
- addition of areas between the rail tracks and Basins K1, K2, and J, and
- removal of the dock area as the dock now drains to the onsite treatment facility, which discharges to the sanitary system.

A pH adjustment system with the addition of biochar was installed in 2018 to treat stormwater runoff from KM's leasehold; in 2022 a StormwateRx Aquip filtration unit was added to the treatment train.

In addition to the COIs discussed below, Basin L was historically sampled for other metals, pesticides, PCBs, and phthalates prior to implementation of source control measures. These parameters were removed from the list of COIs for this basin due to results that were either below the knee of the rank order curve or were less than 10 times their SLV.

2.5.1.1 Historical Uses

Basin L has historically been used for warehousing and rail and ship import and export of materials, including soda ash and pencil pitch.

2.5.1.2 Metals

Post-stormwater filter data obtained for Basin L performance monitoring (MFA, 2024 show that copper and zinc concentrations in Basin L stormwater are well below their SLVs and the knee of the curve for Portland Harbor industrial sites (Appendix B).

2.5.1.3 PAHs

Basin L was originally sampled for PAHs because of 1) historical activities, 2) it was a COI for Terminal 4 sediment, and 3) some PAHs were detected in surface soils during the initial site Remedial Investigation (RI; Ash Creek Associates, 2009). PAH remained a constituent of concern for Basin L stormwater as of 2020. Post-filtration data from the new StormwateRx Aquip unit installed in Basin L found five PAHs above SLVs, but none above ten times their SLV, in four post-filter samples. All post-filter samples were below the knee of the rank order curve.

2.5.1.4 Summary

- As of 2020, PAHs were the only constituents of concern remaining in Basin L.
- The current land use has not substantially changed since the 2007 SW Work Plan, except for modifications to the delineation of Basin L which have resulted in a smaller basin.
- A StormwateRx Aquip unit was added in 2022, and post-filter PAH concentrations in stormwater samples have been low (see Section 7).

2.5.2 Basin M

The current land use for Basin M is largely open space and is partially occupied by the IRM leasehold and a small portion of the KM leasehold. Activities conducted by IRM include storing, handling, and distributing bulk liquid and granular products. Activities conducted by KM in this area are limited to rail operations. These land uses have not changed since the SW SCE workplan was written in 2007. Changes to the delineation of this basin since 2007 have included removal of areas north of the railroad tracks and removal of an approximately 3.5-acre area surrounding the storage tanks on the IRM leasehold, as this area is isolated with a containment berm and all stormwater infiltrates or evaporates.

A conveyance system cleanout of Basin M was completed in June 2010. Since 2010, a bioswale and bioretention basin which treat 0.14 acres of impervious runoff were constructed as part of rehabilitation of the T4 entrance road project (2013), permeable pavement which treats runoff from 1 acre of roadway in Basins M, N, and O was added (2015), and a bioinfiltration basin that treats and infiltrates greater than 90 percent of average annual runoff from Basin M was constructed (2021; see Sections 6 and 7).

In addition to the COIs discussed below, Basin M was historically sampled for additional metals, pesticides, PCBs, and phthalates prior to implementation of source control measures. These parameters were removed from the list of COIs for this basin due to results that were either below the knee of the rank order curve or were less than 10 times their SLV.

2.5.2.1 Historical Uses

Historically, land uses at Basin M have included vehicle parking, equipment storage, and rail import and export of materials, including caustic soda, non-organic fertilizer, magnesium chloride, lignin, lignon-sulfonate, molasses products, tallow, propylene glycol, and vegetable oil. H. N. Leckenby operated a fumigation plant just in front of the current IRM tanks beginning in 1923 where cotton, peanuts, rice, beans, and other foodstuffs were fumigated. The plant may have also been used by the U.S. Army during World War II to deinfestate soldiers and prisoners of war. Fumigation operations continued until the mid-1950s (Blasland, Bouck, and Lee, 2005). Portions of the pier were demolished in the 1990s, and most of the pavement was removed from this basin between late 2005 and early 2006.

2.5.2.2 Metals

Metals measured during studies completed after the storm system was last cleaned out have shown concentrations of Al, As, Cd, Cu, Pb, and Zn to be occasionally above SLVs, but only Al, As, and Pb were above ten times the SLV in any sample. All metals concentrations except arsenic are below the knee of the rank order curve. Approximately 33% of the arsenic stormwater concentrations in Basin M were above the knee of the curve with the highest concentration exceeding the knee by a factor of 5.4. However, arsenic is naturally occurring in the Lower Willamette Valley and these concentrations are within the range of regional groundwaters (Anchor QEA et al., 2022).

2.5.2.3 PAHs

Since late 2010, fourteen PAH samples have been collected in Basin M. Out of these, 14 PAHs have been measured above their SLV, and seven have been measured at greater than ten times the SLV. Most of these samples are below the knee of the rank order curve, though the highest concentrations approach the knee of the curve.

2.5.2.4 Summary

- The current land use has not substantially changed since the 2007 SW Work Plan, except for several modifications to the delineation of Basin M.
- The loading of COIs to Slip 1 has been greatly reduced by the installation of a bioinfiltration basin that infiltrates greater than 90 percent of long-term average annual runoff (see Section 7).

2.5.3 Basin N

The current land use in Basin N is mostly vacant, but includes access roads, rail spurs, and a portion of the IRM leasehold. This land use has not substantially changed since the 2007 SW Work Plan.

In 2015, permeable pavement which treats runoff from 1 acre of roadway in Basins M, N, and O was added as part of the T4 entrance road rehabilitation project. The Basin N storm drain network was cleaned out in fall of 2021, with lines videoed after completion to confirm the success of cleanout work (Geosyntec, 2022a).

Basin N was not sampled for stormwater prior to 2020.

2.5.3.1 Historical Uses

Basin N has historically contained a liquid bulk storage facility, which was operated by Pacific Molasses/PM-Ag, among others. The facility was constructed in 1919 and added to in 1931 to include a warehouse, tank car cleaning facility, and an edible-oil cleaning pit. Materials handled included liquid fertilizer, molasses and molasses products, tallow, urea, caustic soda, and fats. The original public storage tanks were removed in the 1990s, but five privately owned tanks remain in use. PM-Ag also used an 8,000-gallon underground storage tank for diesel, which was removed in 1991 (Blasland, Bouck, and Lee, 2005). A 3,000-gallon underground diesel storage tank was removed from the IRM leasehold in 1995 and was issued a No Further Action determination by DEQ (Blasland, Bouck, and Lee, 2005).

In addition, Basin N contained the historic Rogers Terminal and Shipping facility. Several of the Rogers Terminal and Shipping buildings were demolished between late 2004 and early 2005. The remaining buildings are used by Port Facility Maintenance.

2.5.3.2 Metals

Basin N was sampled for mercury in 2022 due to a somewhat elevated concentration of mercury noted in solids samples scraped from the pipe during disposal characterization sampling prior to full storm line cleanouts. No mercury was detected in any storm water sample post-line cleanout.

2.5.3.3 PAHs

The 2021 Stormwater Evaluation Report (SER) found somewhat elevated PAHs in two of four samples based on rank order curves. As such, the Basin N storm drain system was cleaned out in 2021 and re-sampled in 2022. The 2022 SER found five PAHs above the SLVs with a maximum exceedance factor of 2.1. All samples were below the knee of the rank order curves (Appendix B).

2.5.3.4 Dioxins and Furans

Basin N stormwater was sampled for dioxins and furans as part of both the 2021 and 2022 SERs. In all samples, TCDD-TEQ was greater than ten times the SLV. However, rank order curves have not been developed for dioxins and furans. Based on readily publicly available dioxin and furan data in stormwater for other Portland Harbor sites, the dioxins and furans in Basin N stormwater are not elevated (see Section 5.3.3 for additional information).

2.5.3.5 Summary

- The 2022 SER concluded that Basin N is controlled for the stormwater pathway.
- The current land use has not substantially changed since the 2007 SW Work Plan.

2.5.4 Basin O

The current land use for Basin O is limited; it is vacant from operations except for IRM's above-ground liquid pipeline which was installed in 2010, and a parking area which is used by trucks and Port maintenance. The land uses have not changed since the SW SCE workplan was written in

2007. Changes to the delineation of this basin since 2007 consist mostly of the removal of a small area, now known as Basin P, surrounding the City of Portland Outfall 52C (see Section 2.5.5).

In 2015, permeable pavement which treats runoff from 1 acre of roadway in Basins M, N, and O was added as part of the T4 entrance road rehabilitation project. The Basin O storm drain network was cleaned out in fall of 2021, with lines videoed after completion to confirm the success of cleanout work (Geosyntec, 2022a). Additional sampling was completed following the implementation of source controls in 2022 (see Sections 5 and 6).

In addition to the COIs discussed below, Basin O was sampled for BEHP prior to implementation of source control measures (Geosyntec, 2021). This parameter was removed from the list of COIs for this basin due to results that were either below the knee of the rank order curve or were less than 10 times their SLV.

2.5.4.1 Historical Uses

Historic land uses in Basin O are limited and include ancillary areas to grain storage silos and possibly a disposal area for creosoted wood (Ash Creek Associates, Inc./Newfields, 2007b). The area was also used to store stockpiled soils excavated during the development of the Toyota leasehold.

2.5.4.2 PAHs

The 2021 SER found elevated PAHs in one of four samples based on rank order curves. As such, the Basin O storm drain system was cleaned out in 2021 and re-sampled in 2022. The 2022 SER again found elevated PAHs in one of three samples, with 10 PAHs above the SLV, and five PAHs greater than 10 times the SLV. The elevated sample had concentrations that were on the knee of the rank order curve. In both the 2021 and 2022 report, the elevated PAH concentrations were associated with elevated TSS concentrations.

2.5.4.3 Dioxins and Furans

Basin O stormwater was sampled for dioxins and furans as part of both the 2021 and 2022 SERs. In all samples, TCDD-TEQ was greater than ten times the SLV. However, rank order curves have not been developed for dioxins and furans. Based on readily publicly available dioxin and furan data in stormwater for other Portland Harbor sites, the dioxins and furans in Basin O stormwater are not elevated (see Section 5.3.3 for additional information), although dioxin and furan concentrations were higher during the events with elevated TSS.

2.5.4.4 Summary

- Basin O has been a focus of source control since 2020; additional post-SCM data are presented later in this report.
- As of the 2022 SER, PAHs and dioxins and furans were the only remaining COIs in Basin O, and generally only when associated with elevated TSS (see Section 7).
- The current land use has not substantially changed since the 2007 SW Work Plan.

2.5.5 Basin P

Basin P did not exist in previous delineations of T4 stormwater basins but was primarily a portion of Basin O. Basin P was thought to contain no stormwater infrastructure (e.g., no catch basins or outfall) linked to the basin's runoff, and it was believed that runoff either infiltrated or sheet flowed off the end of the low dock which makes up much of the basin's drainage area. However, in 2021, two catch basins, each with their own outfall pipe, were discovered at the base of the ramp to the low dock. The low dock is not actively used.

The current land use for Basin P is very limited and is vacant from operations; the land use for this area has not changed since the 2007 SW Work Plan (see Section 4.3.7). The Basin P catch basins were cleaned out in fall of 2021.

2.5.5.1 PAHs

The 2022 SER found no PAHs above the SLVs. All samples were below the knee of the rank order curves (Appendix B).

2.5.5.2 Dioxins and Furans

TCDD-TEQ was greater than ten times the SLV in two of three samples. However, rank order curves have not been developed for dioxins and furans. Based on readily publicly available dioxin and furan data in stormwater for other Portland Harbor sites, the dioxins and furans in Basin P stormwater are not elevated (see Section 5.3.3 for additional information).

2.5.5.3 Summary

- The 2022 SER concluded that Basin P is controlled for the stormwater pathway.
- The current land use has not substantially changed since the 2007 SW Work Plan.

2.5.6 Basin Q

The current land use for Basin Q is mostly vacant, but includes rail spurs servicing IRM, the facility entrance road, T4 guard station, and the Port's Marine Operations administrative building. Stormwater management and controls were expanded in 2013 to include a bioswale and bioretention basin that manage 3.32 acres of impervious runoff from Basin Q. The land use in Basin Q has not changed since the 2007 SW Work Plan, except for expanding the stormwater management and controls. Changes to the delineation of this basin have been minimal as well.

The 2009 SW SCE concluded that no further source controls were needed for this basin (Ash Creek Associates, 2009).

In addition to the COIs discussed below, Basin Q was historically sampled for other metals and pesticides prior to implementation of source control measures. These parameters were removed from the list of COIs for this basin due to results that were either below the knee of the rank order curve or were less than 10 times their SLV.

2.5.6.1 Historical Uses

Basin Q was historically used for grain storage and associated rail and ground support activities. This basin was mostly occupied by eight grain silos, which were demolished in 2008. IRM's above-ground liquid pipeline, which was constructed in 2010, runs along the southern edge of Basin Q.

2.5.6.2 PAHs

The 2021 SER found six PAHs above SLVs in stormwater, none of which were above 10 times their SLV. Total PAH concentrations in stormwater and stormwater solids were below the knee of the curve for Portland Harbor sites (Appendix B).

2.5.6.3 PCBs

The 2011 Source Control Completion Report found one Aroclor minimally above its SLV, but less than ten times its SLV. Total PCB congeners and Aroclors were also above ten times the SLV, however, concentrations were well below the knee of the curve for Portland Harbor sites (Appendix B).

2.5.6.4 Phthalates

BEHP was sampled in stormwater as part of the 2021 SER and was not detected in any sample.

2.5.6.5 Dioxins and Furans

TCDD-TEQ was greater than ten times the SLV in all samples. However, rank order curves have not been developed for dioxins and furans. Based on readily publicly available dioxin and furan data in stormwater for other Portland Harbor sites, the dioxins and furans in Basin Q stormwater are not elevated (see Section 5.3.3 for additional information).

2.5.6.6 Summary

- The 2021 SER confirmed that Basin Q is controlled for the stormwater pathway.
- The current land use has not changed, and stormwater management and controls have been expanded since the 2007 SW Work Plan.

2.5.7 Basin R

The current land use for Basin R is mostly vacant, except for the area leased by Grain Craft who operates a flour mill. The land use in this basin has not substantially changed since the 2007 SW Work Plan, except for the construction of IRM's above-ground liquid pipeline and demolition of a grain conveyance bridge, both conducted in 2010.

The delineation of Basin R has changed since the 2007 SW Work Plan. The primary change is removal of a large area to the north of the basin, which has been added to the Basin S delineation. The new delineation depicts a more accurate drainage of the stormwater, with Basins R and S each having one outfall.

Basin R was sampled as a part of the 2009 SW SCE and it was concluded that no further source control measures were recommended for the basin.

2.5.7.1 Historical Uses

Similar to Basin Q, Basin R was historically used for ancillary activities to support grain import, export, and storage. The basin has served as a mill since the early 1900s, first operating as Eagle Flour, and then as Terminal Flour Mills for about 60 years (Port of Portland, 2010b). Terminal Flour Mills operated three underground storage tanks, including a 10,000-gallon fuel oil tank north of the flour mill, a 1,000-gallon diesel tank located south of the flour mill, and a 1,000-gallon fuel oil tank located south of the flour mill. All three tanks were removed, but the removal dates are unknown (Blasland, Bouck, and Lee, 2005). Portions of the pier within Slip 1 were demolished in the 1990s.

2.5.7.2 Metals

The SW SCE found As, Cd, Cu, and Zn to be above SLVs in stormwater, but none were above ten times their SLVs. All values were below the knee of the curve for Portland Harbor industrial sites (Appendix B).

2.5.7.3 PAHs

The SW SCE noted 6 PAHs above SLVs in post-cleanout samples, but none above ten times their SLV. PAHs were also below the knee of the curve for Portland Harbor sites (Appendix A).

2.5.7.4 Pesticides

Pesticides were only sampled prior to a partial storm drain cleanout, so conditions have likely improved since the data were obtained. The pre-cleanout stormwater samples for the 2009 SW SCE noted four pesticides (DDx compounds) above their SLVs, but only two above ten times their SLV.

2.5.7.5 PCBs

No PCB Aroclors were above SLVs; PCB Aroclors were all non-detect except for Aroclor 1242, which was below the SLV. Total PCB congeners in stormwater were above SLVs but were generally similar in concentration to samples in Basin Q and were below the knee of the curve for Portland Harbor sites (Appendix B). PCB congeners were also detected in the method blank sample indicating high bias concentrations.

2.5.7.6 Phthalates

The SW SCE did not detect and phthalates above SLVs in Basin R.

2.5.7.7 Summary

- The 2009 SW SCE concluded that no further action was needed to control the stormwater pathway in Basin R based on the post-cleanout stormwater data.

- The current land use has not changed since the 2007 SW Work Plan work plan and the changes to the Basin R delineation have not affected the land use depiction.

2.5.8 Basin S

The current land use for Basin S is mostly vacant, except for the area leased by Grain Craft who operates a flour mill. The land use in this basin has not changed since the 2007 SW Work Plan. The delineation of Basin S has changed since the 2007 SW Work Plan with the addition of a large area to the west of the basin, which was removed from the Basin R delineation. The new delineation depicts a more accurate drainage of the stormwater, with Basins R and S each having one outfall. Two catch basins in the current delineation of Basin S drain to drywells, and the area is largely pervious. It is likely that most of the flow from this area infiltrates.

The Basin S storm drain network was cleaned out in 2022-2023, with lines videoed after completion to confirm the success of cleanout work. During the course of the cleanouts, a portion of the metal pipe collapsed, which caused a sink hole to form. The degraded metal pipe and most downstream manhole were excavated and replaced, and two cleanouts were added to the pipe to enable easier access in the future (see Section 6). Additional source controls were also completed in 2023 (see Section 6).

This basin had not been sampled prior to 2023 but was included in the most recent round of sampling. These data are presented in Section 5.

2.5.8.1 Historical Uses

As with Basins Q and R, Basin S was historically used for grain import, export, and storage operations. The basin has served as a mill since the early 1900s, first operating as Eagle Flour, and then as Terminal Flour Mills for about 60 years (Port of Portland, 2010b).

2.5.8.2 Summary

- No water quality data are available for Basin S prior to 2023; data collected in 2023 and 2024 are presented later in this report .
- The current land use has not changed since the 2007 SW Work Plan, and the changes to the Basin S delineation have not affected the land use depiction or conclusions in the 2009 SW SCE.

3. POTENTIAL SOURCES AND CONTAMINANTS OF INTEREST

3.1 Potential Contaminant Sources

There are no known ongoing sources of contamination at the Site – all potential contaminant sources are from historical activities. Possible historical sources for COIs include historical handling of pencil pitch; historic storage tanks and pipelines, including diesel storage; a former boiler house; possible creosoted wood storage and waste areas; and a former gas fueling station. More detailed information on potential historical sources and remedial actions is provided in the Site's remedial investigation report (Ash Creek Associates/Newfields, 2007b), feasibility study

(Ash Creek Associates, 2011b), and other reports. Remaining known historical sources of PAHs in near-surface soils within the Slip 1 Upland Area include soil management areas on the north side of the Slip 1: Pier 1 Rail Area and Pier 1 Unpaved Area (Apex, 2019). These areas are located in Basins R and S and are managed to prevent worker exposure, control dust, prevent erosion from stormwater runoff, and prevent the spread of chemicals in soils through construction (Apex, 2019). The emergence of dioxins and furans as a focused COI in Portland Harbor as defined in the Portland Harbor Record of Decision (ROD; EPA, 2017) has been recent. The Port has not identified possible sources of this COI at the Site.

3.2 Outfall Sediment Data

Data summarized in the 2022 T4 Sufficiency Assessment (Anchor QEA, et al. 2022) show no exceedances of surface soil remedial action levels (RALs) or principal threat waste (PTW) thresholds near the Basin L, M, O, Q, or R outfalls (Figure 4). Near the Basin N outfall multiple exceedances of RALs were found for PAHs, PCBs, and dioxins and furans; as well as multiple exceedances of PTW thresholds for dioxins and furans and a single PTW exceedance for PCBs. Near the Basin S outfall, RAL exceedances were measured for PCBs and dioxins and furans in addition to a PTW threshold exceedance for PCBs.

Both areas are marked as conditionally controlled in the T4 Sufficiency Assessment (Figure 4). For the Basin N area, the bank is stabilized with riprap on the lower slope, and potential recontamination will be addressed alongside the adjacent sediment management area (SMA) during the remedial design (RD) process. For the Basin S area, the riverbank is stable except for two small areas of potential erosion, and potential recontamination from bank erosion will be addressed alongside the adjacent SMA during the RD process.

3.3 Contaminants of Interest

Stormwater sampling that occurred between 2020 and 2022 confirmed that Basins N, P, and Q are controlled for all COIs. Remaining potential COIs at the Site for stormwater are PAHs and dioxins/furans in Basin O, and PCBs and dioxins/furans in Basin S.

4. ONGOING STORMWATER MANAGEMENT MEASURES

The Port has implemented numerous source control measures (SCMs) at the Site through various mechanisms, including tenant contracts, the Environmental Management System Program, continual improvement policy, Kinder Morgan's 1200-Z permit, and a Stormwater Master Plan. Non-structural BMP implementations include pavement sweeping, catch basin inserts, conveyance system cleaning, annual cleanout of catch basins, and regular inspections and maintenance of structures, catch basins, and treatment facilities.

Ongoing structural SCMs implemented prior to this report include a pH adjustment system in Basin L, bioswales in Basin Q, and permeable pavement in portions of Basins M, N, and O, are summarized below.

- In 2018 a pH adjustment system was added to Basin L to treat runoff from Kinder Morgan's operations. It consists of a pump station, carbon dioxide, and two reaction tanks.
- In 2013 bioswales and a bioretention basin were constructed in association with rehabilitation of the T4 entrance road. The bioswale and the bioretention basin manage runoff from 0.14 acres of impervious surface in Basin M and 3.32 acres of impervious surface in Basin Q.
- In 2015 permeable pavement was installed as part of the second phase of the entrance road rehabilitation project. Approximately 0.67 acres of permeable pavement was installed to manage runoff from approximately 1 acre of roadway (total of permeable and standard pavement) in Basins M, N, and O.

Additional SCMs have been implemented in Basins L, M, O, and S since 2021, and are described in Section 6.

5. DATA COLLECTION AND INTERPRETATION

5.1 Sampling

Stormwater sampling was conducted in accordance with the most recent DEQ-approved Work Plan (Geosyntec, 2022, Appendix F). Per Section 4 of the Work Plan, samples in Basins O and S were to be collected after additional source control measures were implemented. Samples were to consist of three storm events during the 2022/2023 wet season, collected as time-weighted composite samples for the locations nearest the Basins O and S outfalls, and grab samples for upstream manholes in Basin O. Samples in 2020 and 2022 had shown occasional elevated TSS concentrations in Basin O, so the additional grab samples were included to help narrow down the source of TSS.

Samples from two storm events were collected in spring of 2023. However, an unusually short rainy season and a supplier backorder issue prevented the third sample from being obtained that same season. After reviewing results and consulting with DEQ, additional SCMs were implemented in Basin S (see Section 6) and the third sample was obtained for all locations in January 2024 (Table 4). All samples met the total rainfall depth and rainfall duration targets. The first of the three storms slightly exceeded the antecedent rain depth target. However, all antecedent rainfall occurred 23 hours before the start of the sampled storm. The combination of the minor exceedance of target criteria (0.01 inches) and the duration of time prior to the start of the sampled storm suggest these samples are representative. The second and third storms met the antecedent depth target. All grab samples were obtained within the first three hours of runoff as specified in the Work Plan. Composite sample storm coverage ranged from approximately 75 to 100 percent of storm runoff duration (Table 5), and all composite samples were made up of at least 10 separate aliquots of approximately 250 mL each. These composite samples are therefore compliant with Washington Department of Ecology Guidance for Automatic Sampling, which recommends that at least 75% of the storm event be captured, each sample be a minimum of 200 mL, and at least 10 aliquots be collected (Ecology, 2018). Furthermore, autosamplers were always started within

the first hour of runoff. Storm event hyetographs and autosampler output files can be found in Appendix C and D.

Table 4. Summary of Sampled Storm Events

Storm Start Date	Total Rain Depth (in)	Runoff Duration, Basin O (h)	Runoff Duration, Basin S (h)	24 h Antecedent Rain Depth (in)	Basins Sampled
3/31/2023	0.45	16	16	0.11	O, S
4/9/2023	1.75	< 24	< 24	0.00	O, S
1/26/2024	2.10	< 24	< 24	0.03	O, S
Target	**> 0.20**	**> 3**	**> 3**	**< 0.10**	**O, S**

Table 5. Summary of Storm Coverage for Time-Weighted Composite Samples

Sample Point	Approximate Autosampler Coverage of First 24 h of Storm[1]		
	3/12/2022	4/3/2022	4/29/2022
Basin O	75%	97%	97%
Basin S	75%	94%	97%

[1]Shaded boxes indicate that at least one aliquot was obtained within the first 30 minutes of runoff.

5.2 Data Summary

Water quality data collected for this report are summarized in Table 6, with locations illustrated in Figure 5. Data are presented in Table 7 and Table 8 as well as Appendix A; original laboratory reports and data validation results are presented in Appendix E.

Table 6. Summary of Representative Data Collected for T4 Slip 1

Basin	Sample ID	Sample Collection Method	Number of Samples[1]			
			TSS *SM 2540D*	PAHs *EPA 8270E*	Dioxins/Furans *EPA 1613B*	PCBs *EPA 8082A*
Basin S	**STSMH1914**	Time-weighted composite	3	-	3	3
Basin O	**STSMH2712**	Time-weighted composite	3 (1)	3 (1)	3 (1)	-
Basin O	**STSMH2603**	Grab	3	-	-	-
Basin O	**STSMH2615**	Grab	3 (1)	-	-	-
Basin O	**STSMH2713**	Grab	3	-	-	-

[1]Number of duplicates shown in parentheses

Table 7. 2023-2024 Stormwater COI Data

Date	Sample Name	Basin	Sample Type[1]	TCDD TEQ (pg/L)	Total PAHs (µg/L)	cPAHs (µg/L)	Total PCB Aroclors (µg/L)
4/1/2023	STSMH1914	S	TWC	1.84	-	-	<0.00943
4/1/2023	STSMH2712	O	TWC	2.19	0.329	0.053	-
4/10/2023	STSMH1914	S	TWC	1.04	-	-	<0.0102
4/10/2023	STSMH2712	O	TWC	0.781	0.307	0.036	-
4/10/2023	STSMH2712-DUP	O	TWC	0.674	0.282	0.032	-
1/27/2024	STSMH1914	S	TWC	0.369	-	-	<0.0115
1/27/2024	STSMH2712	O	TWC	0	0.107	0.015	-

[1]TWC = time-weighted composite

Table 8. 2023-2024 Stormwater TSS Data

Date	Sample Location	Basin	Sample Type	TSS Concentration (mg/L)
3/31/2023	STSMH2603	O	G	39
3/31/2023	STSMH2615	O	G	34
3/31/2023	STSMH2710	O	G	37
4/1/2023	STSMH2712	O	TWC	13
4/1/2023	STSMH1914	S	TWC	109
4/9/2023	STSMH2603	O	G	7
4/9/2023	STSMH2615	O	G	19
4/9/2023	STSMH2710	O	G	6
4/10/2023	STSMH2712	O	TWC	7
4/10/2023	STSMH2712-DUP	O	TWC	9
4/10/2023	STSMH1914	S	TWC	92
1/26/2024	STSMH2603	O	G	6
1/26/2024	STSMH2615	O	G	8
1/26/2024	STSMH2615-DUP	O	G	12
1/26/2024	STSMH2710	O	G	13
1/27/2024	STSMH2712	O	TWC	6
1/27/2024	STSMH1914	S	TWC	242

5.3 Data Interpretation

5.3.1 Method Detection Level and QA/QC Issues

Target method detection limits (MDLs) were specified in the Work Plan and were sometimes lower or higher than SLVs. The achieved MDLs were always equal to or less than the associated SLV in all samples except for 2,3,7,8-TCDD, where MDLs were always above the SLV. However, the target MDL specified in the Work Plan for 2,3,7,8-TCDD was always met.

The target MDLs specified in the Work Plan for 7 of the PAH congeners and 3 of the dioxin/furan congeners were not always met.

For the 7 PAHs, the MDL was exceeded by less than ten percent. For the 3 dioxin/furan congeners, the MDL was exceeded by less than a factor of two, and the MRLs were always met. These slightly elevated detection limits are not considered impactful to the overall results.

In the STSMH2712 field duplicate sample, two PAHs were measured at concentrations between the MDL and MRL in one sample and were detected above the MRL in the other sample. As such, the RPD was incalculable, and a J-flag was added to each value. In the STSMH2615 duplicate the RPD for TSS was greater than 30%, so a J-flag was applied. As this was a field duplicate from a flowing pipe, and not a field split, this could be indicative of variability in water quality rather than an issue with repeatability of field methods.

5.3.2 Comparisons to SLVs and Knee of the Curve Plots

To put the results within the context of the Portland Harbor Superfund Site, data are compared to JSCS SLVs for water for Portland Harbor (DEQ and EPA, 2005), Portland Harbor Record of Decision (ROD) Cleanup Levels (CULs) for surface water (EPA, 2017), and rank order curves for stormwater developed by DEQ for the stormwater pathway in Portland Harbor (DEQ, 2017).

5.3.2.1 Basin O

In Basin O, six PAHs were measured at levels greater than the associated SLVs in at least one representative sample. However, no PAH was detected at greater than 3.5 times the SLV in any sample. All three samples were below the total PAHs knee of the curve. Six PAHs were detected in at least one sample above their CUL. Exceedance factors for cPAHs ranged from 9 to 52.

TCDD-TEQ was greater than one hundred times the SLV and greater than one thousand times the CUL for the first two samples; for the last sample, no dioxins or furans were detected. Additional discussion on dioxins and furans is provided in Section 5.3.3.

TSS was consistently low in all samples – both upstream and near the outfall.

5.3.2.2 Basin S

No PCBs were detected in any sample from Basin S. TCDD-TEQ was greater than one hundred times the SLV and greater than one thousand times the CUL for the first two samples; for the last sample, TCDD-TEQ was 72 times the SLV and 740 times the CUL. Additional discussion on dioxins and furans is provided in Section 5.3.3.

While TSS was elevated (over 100 mg/L in two of three samples), higher TSS did not correlate with higher COI concentrations in Basin S.

5.3.3 Dioxins and Furans

Issues related to the availability of dioxin and furan data in Portland Harbor stormwater were described in the 2021 T4 Stormwater Evaluation Report (Geosyntec, 2021). In summary, prior to publication of the Portland Harbor ROD, dioxin/furan data were not collected from Portland Harbor sites unless historical or current activities were associated with a potential source of dioxins/furans for the site. As a result, compared to other Portland Harbor COCs (e.g. PCBs and PAHs), limited data are available to support evaluations of dioxins/furans in stormwater versus concentrations typical of urban industrial sites; this includes a lack of dioxin/furan data available in previous source control decisions made by DEQ. DEQ's stormwater guidance does not contain a screening chart (commonly referred to as rank order curve or knee-of-the-curve plots) for dioxins/furans for Portland Harbor sites.

Because of this, additional lines of evidence have been used to place the results from Basins O and S into appropriate context for this source control evaluation.

5.3.3.1 Comparison to Other Sites with Stormwater Dioxin/Furan Data

Although dioxin/furan data is limited in Portland Harbor, some sites have data publicly available for dioxin/furan concentrations in stormwater through DEQ's ECSI database. Table 7 summarizes the available dioxin/furan data in stormwater compiled from other sites located within the lower Willamette River, including data collected at T4 Slip 1 both pre- and post-SCM.

The limited available information from other Portland Harbor sites puts post-SCM results for T4 Slip 1 towards the lower end of publicly available dioxin/furan data for stormwater in Portland Harbor.

Table 9. Comparison of Publicly Available TCDD-TEQ Concentrations in Stormwater for Portland Harbor Sites to T4 Representative Sample Results

Property and Sample Name	**Detected TCDD-TEQ Concentration in Stormwater (factor times SLV)[1]**		
Arkema, treated effluent	54 – 18,000		
Rhône-Poulenc	<1 – 24		
Vigor Industrial	350 – 13,000		
Burgard Industrial Park[1]			
Felton Properties	29 – 2,900		
Portland Container	8		
Former Boydstun NE	200		
Pro Truck Lines / Romar	59		
RB Recycling	98 – 980		
Dunkin Bush	10 – 7,800		
Terminal 4 Slip 1 Upland Facility			
	Pre-Cleanout (2020-2021)	*Post-Cleanout (2022)*	*Basin O – Post Additional SCMs Basin S Post-Cleanout (2023-2024)*
Basin N	84 – 1,000	11 - 59	-
Basin O	57 – 7,800	130 – 1,600	ND - 430
Basin P	-	2 - 66	-
Basin Q	180 - 440	-	-
Basin S	-	-	72 - 360

[1]Based on data available in the DEQ ECSI database as of September 2021.
[2]The Burgard Industrial Park document cites these values as simply, "dioxin concentration." It is assumed this refers to TCDD-TEQ concentration.

5.3.4 Discussion

COI concentrations for PAHs and PCBs were low in Basins O and S in relation to the knee of the curve, SLVs, and CULs. TCDD-TEQ concentrations were low in relation to other Portland Harbor industrial sites.

6. SOURCE CONTROL MEASURES

SCMs implemented since 2021 and not described in the 2022 Stormwater Evaluation Report (Geosyntec, 2022a) are described below. Ongoing SCMs implemented prior to or as part of the 2022 report are described in Section 4.

6.1 Basin L

In May 2022, a StormwateRx Aquip treatment system was brought online to treat stormwater runoff from Basin L. The new treatment system is installed downstream of the existing pH adjustment system and is designed to treat up to Oregon's 1200Z Industrial Stormwater General Permit Tier 2 design storm (50% of the 2-year 24-hour storm). Additional information on the design of the system was provided to DEQ in an SCM Work Plan (MFA, 2022), and performance data were presented in a performance verification report (MFA, 2024). Data show the SCM is effective. Additional details are provided in Section 7.1.1, post-filter data are included in Appendix A and data are plotted on rank order curves in Appendix B.

6.2 Basin M

A vegetated bioinfiltration basin was brought online in Basin M in December 2021. The SCM is designed to capture and infiltrate greater than 90 percent of average annual runoff from Basin M. Hydraulic performance of the SCM was evaluated as part of the Comprehensive Report for Operational Year 2, and approved by DEQ (Geosyntec, 2024). Data show the SCM is performing as designed. Additional details are provided in Section 7.1.2.

6.3 Basin O

Following the 2022 report, additional SCMs were added to Basin O (Figure 6). Specifically, the pavement was swept, gravel which covered some areas of pavement was removed, catch basin inserts were added, traffic control measures were added to reduce track-out, and a sediment trap was installed around the one catch basin located in a pervious area.

6.4 Basin S

Basin S was not sampled in 2022 as, during pipe cleanout work, it was discovered that the Basin S main pipe was degraded beyond the point of rehabilitation in one section. As such, the degraded section of pipe was replaced, a new manhole was installed, and two additional cleanouts were added to the line to enable future cleanout work if necessary. The rest of the pipe was then cleaned and CCTV inspected after the rehabilitation work was completed. Before the final Basin S sample was obtained in January 2024, the gravel around STSCB6036 was replaced, several of the catch

basin inserts were modified to create a better fit to the non-standard catch basins in this area, and the paved areas in this basin were swept.

7. SOURCE CONTROL EVALUATION

7.1 Data Evaluation

7.1.1 Basin L

As presented in the Performance Verification Report (MFA, 2024), which has been accepted by DEQ, the Basin L StormwateRx Aquip treatment system is successfully reducing PAH concentrations. Average percent reduction for PAHs during four storms in 2022-2023 ranged from 71 to 81 percent depending on congener (see Appendix A). All post-filter concentrations were below 10 times the SLVs, and total PAHs were below the knee of the Portland Harbor rank order curve for all events (Appendix B). Given these data and Kinder Morgan's 1200-Z permit which requires ongoing management of stormwater quality, this basin can be considered controlled for the stormwater pathway.

7.1.2 Basin M

As presented in the Comprehensive Report for Operational Year 2 (Geosyntec, 2024), which has been accepted by DEQ, infiltration rates have remained relatively high at around 10 to 50 inches per hour depending on season and ponded water depth. The SCM achieved 84-87% capture of stormwater during its second operational year – a year in which both a 2- and a 5-year storm occurred. Both storms exceeded the design capacity of the SCM and were responsible for most of the uncaptured storm volume. In total, the SCM infiltrated nearly 4 million gallons of stormwater between July 2022 and June 2023. Hydraulic monitoring and reporting will continue through June 2026 and maintenance procedures detailed in the approved O&M Plan (Geosyntec and WHP, 2021) are expected to keep the SCM functioning well throughout its lifespan. Given these data and the plan in place, this basin can be considered controlled for the stormwater pathway.

7.1.3 Basin N

Basin N was concluded to be controlled following the 2022 Stormwater Evaluation Report (Geosyntec, 2022a) following post-storm line cleanouts and CCTV confirmation.

7.1.4 Basin O

At the beginning of the 2023-2024 sampling work, the only COIs remaining in Basin O were PAHs and dioxins and furans, particularly when correlated with high TSS. No high TSS events were observed following completion of the most recent SCMs described in Section 6.3. PAHs were low, with only minimal exceedances of SLVs and total PAHs well below the knee of the curve on the rank order plots. Dioxins and furans were also low compared to available data from other nearby Portland Harbor sites. Given these data, this basin can be considered controlled for the stormwater pathway.

7.1.5 Basin P

Basin N was concluded to be controlled following the 2022 Stormwater Evaluation Report (Geosyntec, 2022a) following catch basin cleanouts.

7.1.6 Basin Q

Basin Q was concluded to be controlled following the 2021 Stormwater Evaluation Report (Geosyntec, 2021).

7.1.7 Basin R

Basin R was concluded to be controlled following the 2009 Stormwater Source Control Evaluation (Ash Creek Associates, 2009).

7.1.8 Basin S

Basin S had never been sampled prior to implementation of this most recent work plan. PCBs were never detected in Basin S stormwater, and dioxins and furans were low compared to available data from other nearby Portland Harbor sites. Given these data, this basin can be considered controlled for the stormwater pathway.

7.2 Other Lines of Evidence

The Port's MS4 permit, tenant Kinder Morgan's 1200-Z permit, and the Basin M O&M manual require ongoing inspections and maintenance activities that will help to keep the existing SCMs functioning as intended.

8. FINDINGS AND CONCLUSIONS

Based on DEQ guidance for presenting findings and conclusions, the following is summarized based on this investigation study (DEQ, 2017).

1. Existing and potential facility-related contaminant sources have been identified and characterized.
    - Previous studies over the past 20+ years established potential sources of contaminants. This is discussed extensively in the 2019 Work Plan.
    - There have been no significant changes in land uses since investigations began at the Site 20+ years ago.
    - There are no known significant ongoing sources of COIs to stormwater at the Site.
    - Concentrations of COIs are not elevated compared to concentrations at other Portland Harbor industrial sites.
2. Contaminant sources are being controlled to the extent feasible.

- Line cleanouts were conducted recently in Basins N, O, P, and S and historically in Basins L and R.
- Structural SCMs are in place in Basins L, M, and O.
- Routine inspections and non-structural BMPs (e.g., pavement sweeping) occur as part of normal facility operations and in accordance with the Port's MS4 permit and Kinder Morgan's 1200-Z permit.
- Concentrations of COIs are not elevated compared to concentrations at other Portland Harbor industrial sites.

3. If pre- and post-SCM data was collected, post-SCM data supports the conclusion that the SCM is effective.
    - In previous reports, post-SCM data have shown that stormwater in Basins R (Ash Creek, 2009), Basin Q (Geosyntec, 2021), and Basins N and P (Geosyntec, 2022a) are controlled for the stormwater pathway.
    - Performance verification reports for Basin L (MFA, 2024) and Basin M (Geosyntec, 2024) have shown that the SCMs installed in these basins are performing as designed, and therefore these basins are controlled for the stormwater pathway.
    - Post-SCM data presented in this report show Basins O and S are now controlled for the stormwater pathway.
4. Adequate measures are in place to ensure source control and good stormwater management measures occur in the future.
    - Port outfalls are covered under the Port's MS4 permit. The Port will continue to follow the requirements of the permit and will continue to implement its maintenance and inspection program at the facility.
    - Basin L is covered under tenant Kinder Morgan's 1200Z permit, which will require ongoing sampling for required parameters.
    - An approved O&M manual is in place for Basin M, and data collection and reporting is scheduled to continue through June 2026.
5. Contaminants in stormwater that continue to exceed SLVs in spite of SCMs and stormwater management measures are not likely to result in sediment contamination in the receiving waterbody or contribute to unacceptable risk.
    - SLV exceedances for most COIs are minimal (less than 10x).

- For dioxins and furans, which have a particularly low SLV, concentrations are low compared to available data from nearby Portland Harbor sites.
- TSS is low (< 20 mg/L) in all basins except Basin S, where TSS has not been found to be correlated with COI concentrations.

The status of the T4 Slip 1 upland basins is summarized in Figure 7. The next step is for DEQ and the Portland Harbor Technical Coordinating Team to concur that T4 Slip 1 is controlled for the stormwater pathway.

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FIGURES

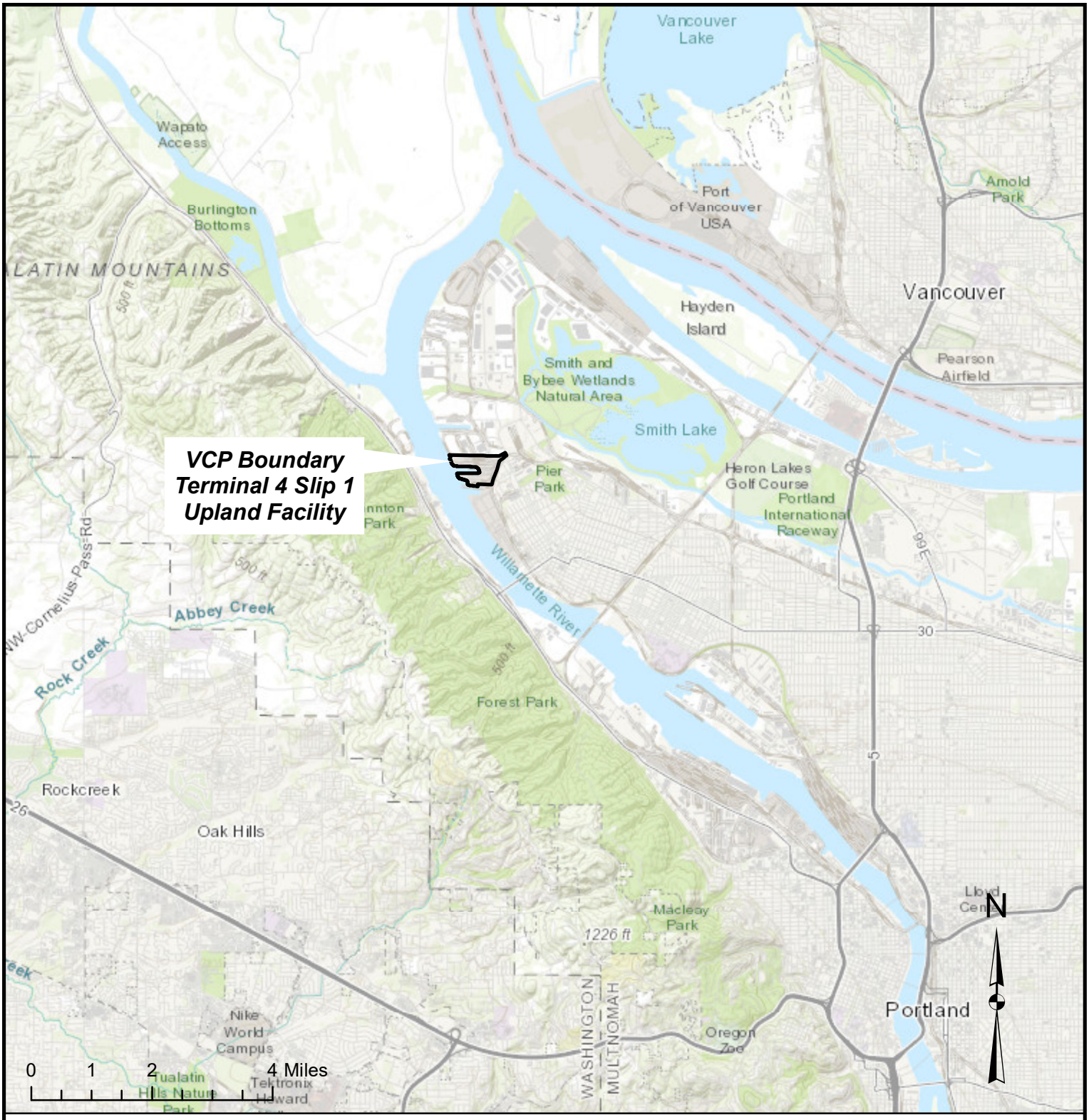
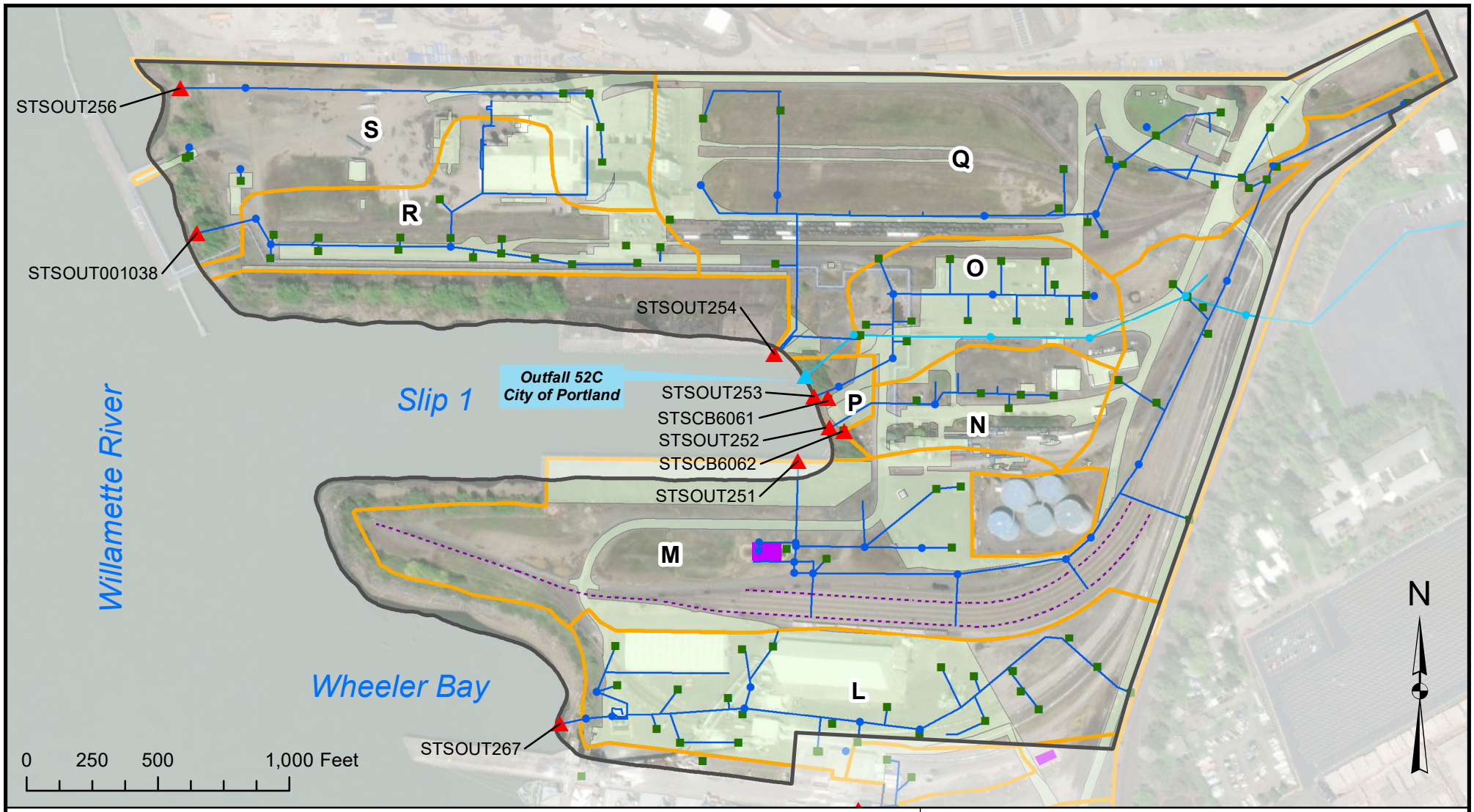


Figure 1: Terminal 4 Slip 1
Upland Facility Location

Terminal 4 Stormwater Source Control
Evaluation - Final Update
Portland, OR

May 2024

Geosyntec consultants



Legend

- Catch Basin

Storm Pipes
- Port-owned
- Port Ballast Subdrain
- City-owned

Outfalls
- Port-owned
- City-owned

Manholes
- Port-owned
- City-owned

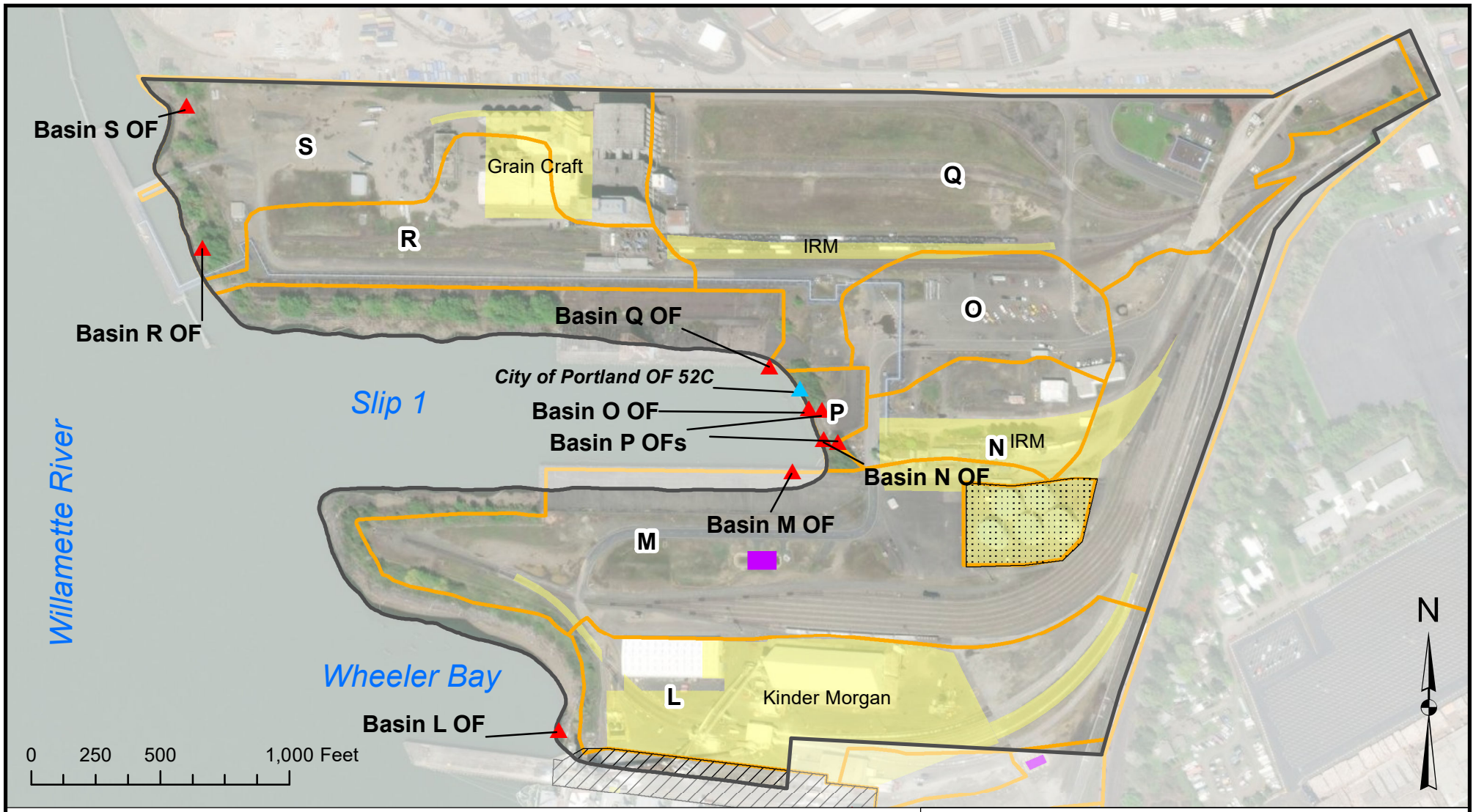
- Slip 1 Upland Facility
- Storm Basins
- Impervious Surface
- Bioinfiltration Basin

Figure 2: Terminal 4 Slip 1 Upland Facility Stormwater Conveyances

Terminal 4 Stormwater Source Control Evaluation - Final Update
Portland, OR

June 2024

Geosyntec consultants



Legend

- Slip 1 Upland Facility
- Storm Basins
- Leaseholds
- Bioinfiltration Basin

Outfalls

- Port-owned
- City-owned

Diverted Stormwater

- self-contained
- drains to sanitary

Figure 3: Terminal 4 Slip 1 Upland Facility Leaseholds and Diversions

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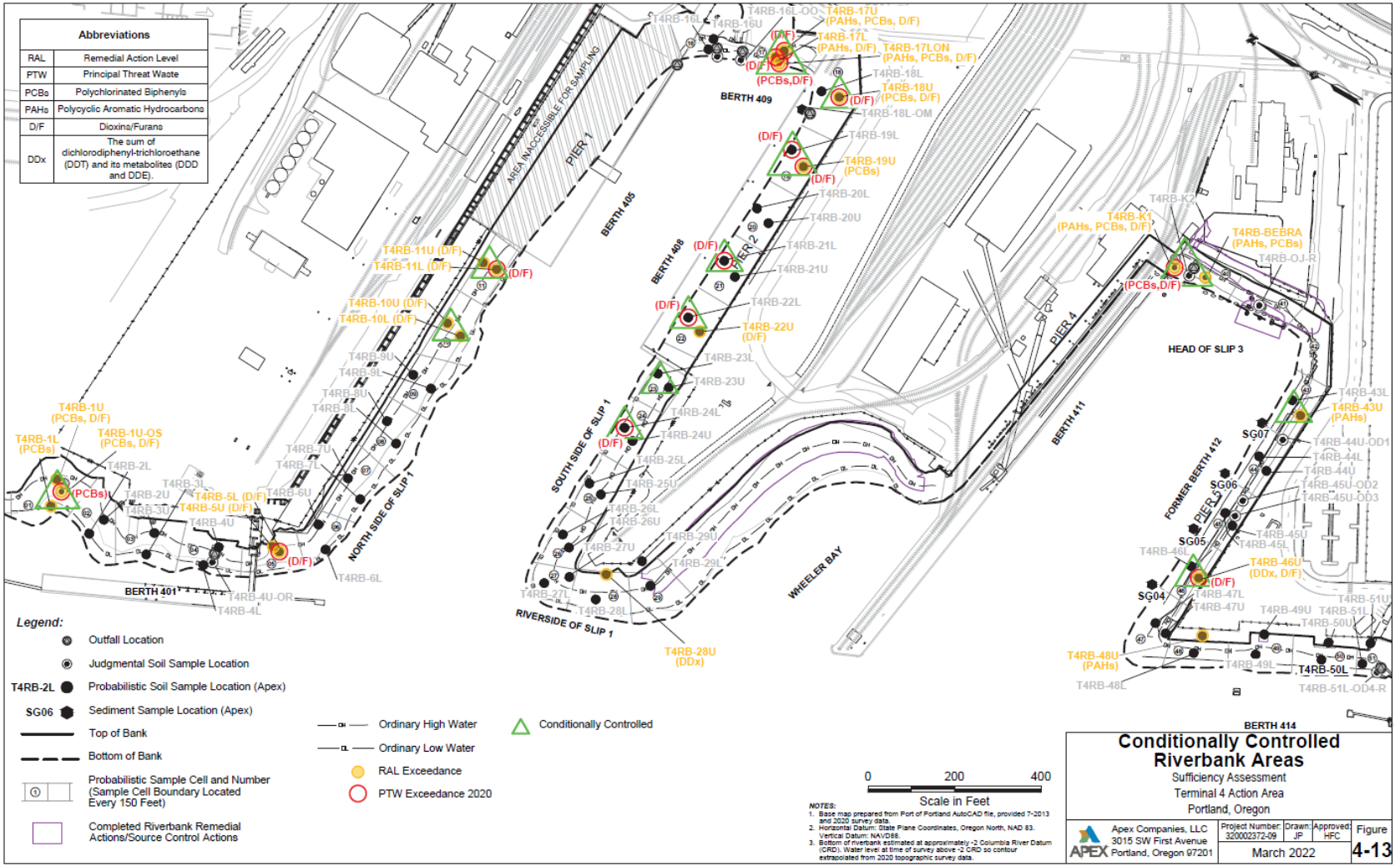
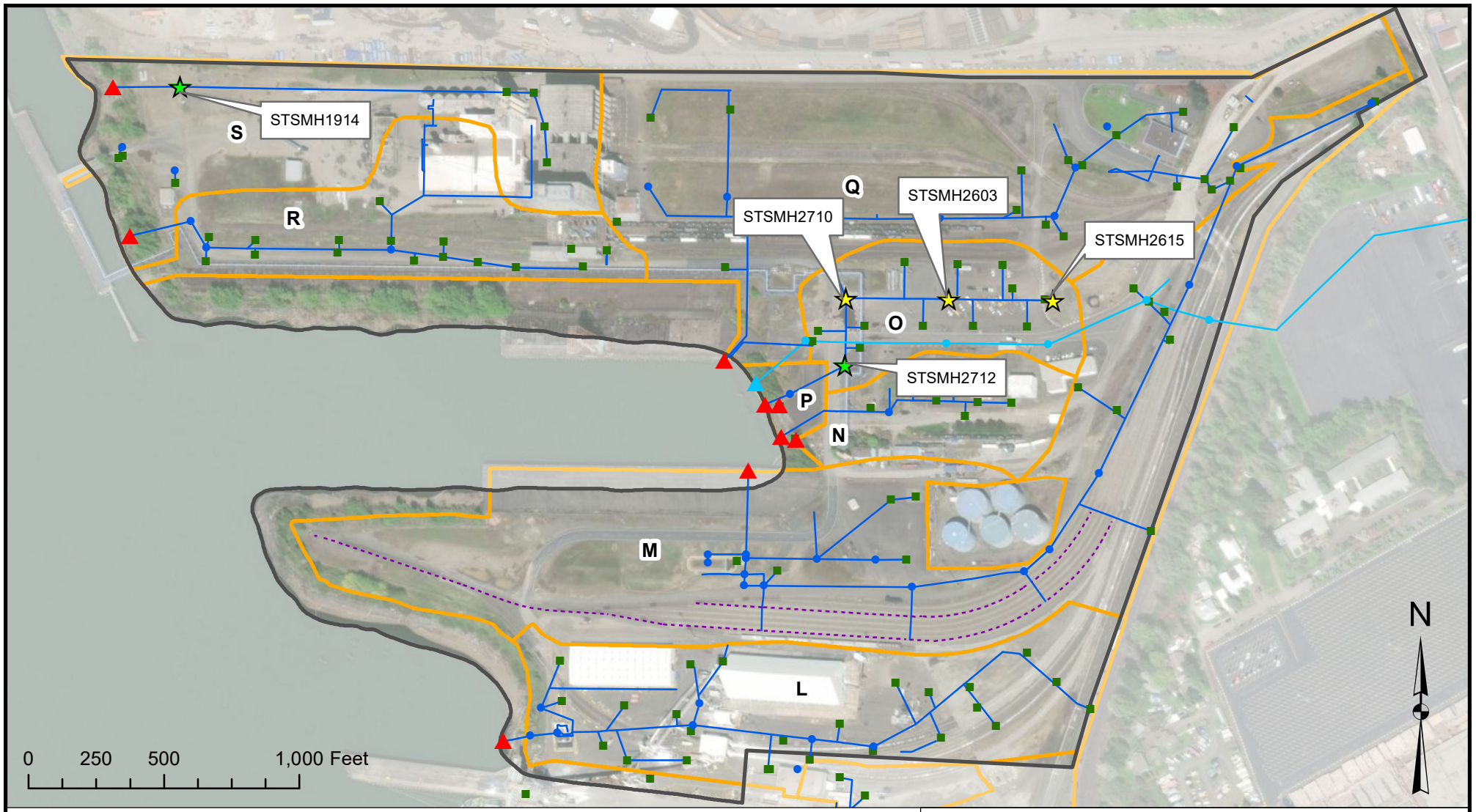


Figure 4. Slip 1 Conditionally Controlled Riverbank Areas (Anchor QEA et al., 2022)



Legend

Sample Location

- Time-weighted composite
- Grab

Storm Pipes

- Port-owned
- Port Ballast Subdrain
- City-owned

- Catch Basin

Manholes

- Port-owned
- City-owned

Outfalls

- Port-owned
- City-owned

- Slip 1 Upland Facility
- Storm Basins

Figure 5: Terminal 4 Slip 1 Upland Facility 2022-2024 Sampling Locations

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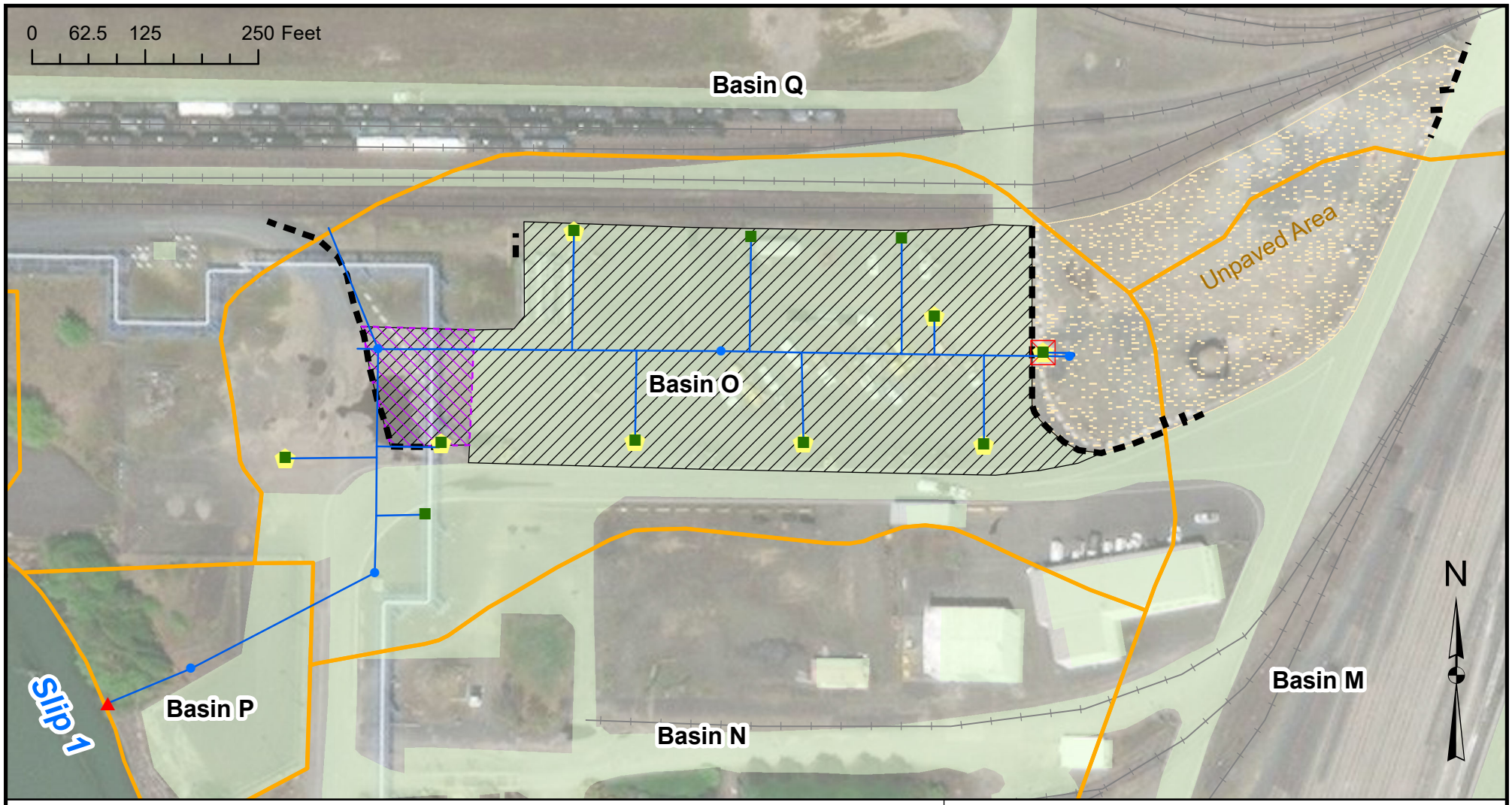

Legend

- Storm Basin
- Impervious Surface
- Railroad
- Storm Line
- Catch Basin
- Manhole
- Outfall

Completed SCMs

- Sweep Pavement
- Remove Gravel
- Install Infiltration Trench / Sediment Trap
- Install Catch Basin Insert
- Add Eco-Blocks

Figure 6: Terminal 4 Slip 1 Upland Facility Basin O Completed SCMs

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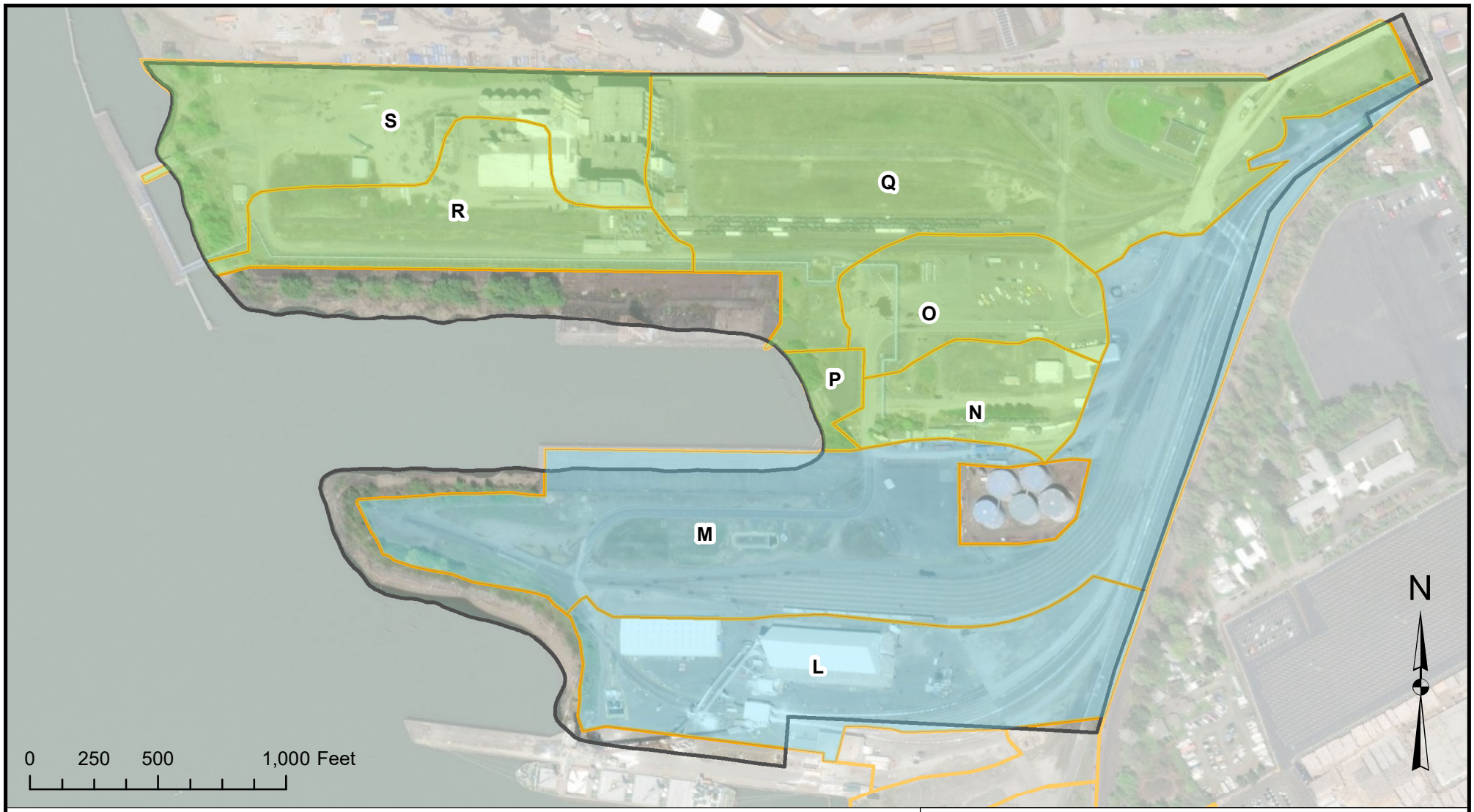

Legend

- Controlled - No Action Needed
- Controlled - Approved O&M Plan or Permit in Place
- Slip 1 Upland Facility
- Storm Basins

Figure 7: Terminal 4 Slip 1 Upland Facility Current Basin Status

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APPENDIX A
T4 Slip 1 Stormwater Data

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin N	3/13/2022	ISCO TWC	Dioxins/Furans	1,2,3,4,6,7,8-HpCDD	24.6	pg/l	J	-	-
Basin N	4/4/2022	ISCO TWC	Dioxins/Furans	1,2,3,4,6,7,8-HpCDD	ND	pg/l	U	-	7.22
Basin N	4/29/2022	ISCO TWC	Dioxins/Furans	1,2,3,4,6,7,8-HpCDD	24	pg/l	J	-	-
Basin P	3/12/2022	ISCO TWC	Dioxins/Furans	1,2,3,4,6,7,8-HpCDD	ND	pg/l	U	-	7.84
Basin P	4/3/2022	ISCO TWC	Dioxins/Furans	1,2,3,4,6,7,8-HpCDD	ND	pg/l	U	-	7.64
Basin P	4/29/2022	ISCO TWC	Dioxins/Furans	1,2,3,4,6,7,8-HpCDD	26.3	pg/l	=	-	-
Basin P	4/29/2022	ISCO TWC-DUP	Dioxins/Furans	1,2,3,4,6,7,8-HpCDD	26	pg/l	=	-	-
Basin Q	10/10/2020	ISCO TWC	Dioxins/Furans	1,2,3,4,6,7,8-HpCDD	51	pg/l	=	45.9	1.68
Basin Q	11/6/2020	ISCO TWC-DUP	Dioxins/Furans	1,2,3,4,6,7,8-HpCDD	155	pg/l	=	50	20.6
Basin Q	11/6/2020	ISCO TWC	Dioxins/Furans	1,2,3,4,6,7,8-HpCDD	146	pg/l	=	50.7	13.6
Basin Q	11/13/2020	ISCO TWC	Dioxins/Furans	1,2,3,4,6,7,8-HpCDD	62.4	pg/l	=	54.7	3.02
Basin Q	12/11/2020	ISCO TWC	Dioxins/Furans	1,2,3,4,6,7,8-HpCDD	164	pg/l	=	54.2	14.6
Basin N	3/13/2022	ISCO TWC	Dioxins/Furans	1,2,3,4,6,7,8-HpCDF	ND	pg/l	U	-	3.79
Basin N	4/4/2022	ISCO TWC	Dioxins/Furans	1,2,3,4,6,7,8-HpCDF	ND	pg/l	U	-	6.05
Basin N	4/29/2022	ISCO TWC	Dioxins/Furans	1,2,3,4,6,7,8-HpCDF	ND	pg/l	U	-	3.92
Basin P	3/12/2022	ISCO TWC	Dioxins/Furans	1,2,3,4,6,7,8-HpCDF	ND	pg/l	U	-	3.38
Basin P	4/3/2022	ISCO TWC	Dioxins/Furans	1,2,3,4,6,7,8-HpCDF	ND	pg/l	U	-	6.75
Basin P	4/29/2022	ISCO TWC	Dioxins/Furans	1,2,3,4,6,7,8-HpCDF	ND	pg/l	U	-	5.46
Basin P	4/29/2022	ISCO TWC-DUP	Dioxins/Furans	1,2,3,4,6,7,8-HpCDF	ND	pg/l	U	-	4.42
Basin Q	11/6/2020	ISCO TWC-DUP	Dioxins/Furans	1,2,3,4,6,7,8-HpCDF	6.24	pg/l	J	50	4.2
Basin Q	11/6/2020	ISCO TWC	Dioxins/Furans	1,2,3,4,6,7,8-HpCDF	6.33	pg/l	J	50.7	3.47
Basin Q	11/13/2020	ISCO TWC	Dioxins/Furans	1,2,3,4,6,7,8-HpCDF	4.38	pg/l	J	54.7	1.44
Basin Q	12/11/2020	ISCO TWC	Dioxins/Furans	1,2,3,4,6,7,8-HpCDF	5.79	pg/l	J	54.2	3.99
Basin Q	10/10/2020	ISCO TWC	Dioxins/Furans	1,2,3,4,6,7,8-HpCDF	ND	pg/l	U	45.9	0.382
Basin N	3/13/2022	ISCO TWC	Dioxins/Furans	1,2,3,4,7,8,9-HpCDF	ND	pg/l	U	-	4.71
Basin N	4/4/2022	ISCO TWC	Dioxins/Furans	1,2,3,4,7,8,9-HpCDF	ND	pg/l	U	-	7.37
Basin N	4/29/2022	ISCO TWC	Dioxins/Furans	1,2,3,4,7,8,9-HpCDF	ND	pg/l	U	-	5.03
Basin P	3/12/2022	ISCO TWC	Dioxins/Furans	1,2,3,4,7,8,9-HpCDF	ND	pg/l	U	-	4.35
Basin P	4/3/2022	ISCO TWC	Dioxins/Furans	1,2,3,4,7,8,9-HpCDF	ND	pg/l	U	-	7.74
Basin P	4/29/2022	ISCO TWC	Dioxins/Furans	1,2,3,4,7,8,9-HpCDF	ND	pg/l	U	-	6.39
Basin P	4/29/2022	ISCO TWC-DUP	Dioxins/Furans	1,2,3,4,7,8,9-HpCDF	ND	pg/l	U	-	5.97
Basin Q	11/6/2020	ISCO TWC	Dioxins/Furans	1,2,3,4,7,8,9-HpCDF	ND	pg/l	U	50.7	6.31
Basin Q	11/6/2020	ISCO TWC-DUP	Dioxins/Furans	1,2,3,4,7,8,9-HpCDF	ND	pg/l	U	50	8.04

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin Q	11/13/2020	ISCO TWC	Dioxins/Furans	1,2,3,4,7,8,9-HpCDF	ND	pg/l	U	54.7	1.92
Basin Q	12/11/2020	ISCO TWC	Dioxins/Furans	1,2,3,4,7,8,9-HpCDF	ND	pg/l	U	54.2	5.53
Basin Q	10/10/2020	ISCO TWC	Dioxins/Furans	1,2,3,4,7,8,9-HpCDF	ND	pg/l	U	45.9	0.527
Basin N	3/13/2022	ISCO TWC	Dioxins/Furans	1,2,3,4,7,8-HxCDD	ND	pg/l	U	-	4.86
Basin N	4/4/2022	ISCO TWC	Dioxins/Furans	1,2,3,4,7,8-HxCDD	ND	pg/l	U	-	12.1
Basin N	4/29/2022	ISCO TWC	Dioxins/Furans	1,2,3,4,7,8-HxCDD	ND	pg/l	U	-	4.63
Basin P	3/12/2022	ISCO TWC	Dioxins/Furans	1,2,3,4,7,8-HxCDD	ND	pg/l	U	-	6.88
Basin P	4/3/2022	ISCO TWC	Dioxins/Furans	1,2,3,4,7,8-HxCDD	ND	pg/l	U	-	10.8
Basin P	4/29/2022	ISCO TWC	Dioxins/Furans	1,2,3,4,7,8-HxCDD	ND	pg/l	U	-	3.77
Basin P	4/29/2022	ISCO TWC-DUP	Dioxins/Furans	1,2,3,4,7,8-HxCDD	ND	pg/l	U	-	8.15
Basin Q	11/6/2020	ISCO TWC-DUP	Dioxins/Furans	1,2,3,4,7,8-HxCDD	ND	pg/l	U	50	6.02
Basin Q	11/6/2020	ISCO TWC	Dioxins/Furans	1,2,3,4,7,8-HxCDD	ND	pg/l	U	50.7	5.21
Basin Q	11/13/2020	ISCO TWC	Dioxins/Furans	1,2,3,4,7,8-HxCDD	ND	pg/l	U	54.7	1.77
Basin Q	12/11/2020	ISCO TWC	Dioxins/Furans	1,2,3,4,7,8-HxCDD	ND	pg/l	U	54.2	4.81
Basin Q	10/10/2020	ISCO TWC	Dioxins/Furans	1,2,3,4,7,8-HxCDD	ND	pg/l	U	45.9	0.988
Basin N	3/13/2022	ISCO TWC	Dioxins/Furans	1,2,3,4,7,8-HxCDF	ND	pg/l	U	-	6.62
Basin N	4/4/2022	ISCO TWC	Dioxins/Furans	1,2,3,4,7,8-HxCDF	ND	pg/l	U	-	7.03
Basin N	4/29/2022	ISCO TWC	Dioxins/Furans	1,2,3,4,7,8-HxCDF	ND	pg/l	U	-	4.14
Basin P	3/12/2022	ISCO TWC	Dioxins/Furans	1,2,3,4,7,8-HxCDF	ND	pg/l	U	-	5.61
Basin P	4/3/2022	ISCO TWC	Dioxins/Furans	1,2,3,4,7,8-HxCDF	ND	pg/l	U	-	12.3
Basin P	4/29/2022	ISCO TWC	Dioxins/Furans	1,2,3,4,7,8-HxCDF	ND	pg/l	U	-	3.33
Basin P	4/29/2022	ISCO TWC-DUP	Dioxins/Furans	1,2,3,4,7,8-HxCDF	ND	pg/l	U	-	3.58
Basin Q	11/6/2020	ISCO TWC	Dioxins/Furans	1,2,3,4,7,8-HxCDF	ND	pg/l	U	50.7	2.58
Basin Q	11/6/2020	ISCO TWC-DUP	Dioxins/Furans	1,2,3,4,7,8-HxCDF	ND	pg/l	U	50	2.36
Basin Q	11/13/2020	ISCO TWC	Dioxins/Furans	1,2,3,4,7,8-HxCDF	ND	pg/l	U	54.7	1.59
Basin Q	12/11/2020	ISCO TWC	Dioxins/Furans	1,2,3,4,7,8-HxCDF	ND	pg/l	U	54.2	2.47
Basin Q	10/10/2020	ISCO TWC	Dioxins/Furans	1,2,3,4,7,8-HxCDF	0.588	pg/l	J	45.9	0.373
Basin N	3/13/2022	ISCO TWC	Dioxins/Furans	1,2,3,6,7,8-HxCDD	ND	pg/l	U	-	3.98
Basin N	4/4/2022	ISCO TWC	Dioxins/Furans	1,2,3,6,7,8-HxCDD	ND	pg/l	U	-	9.51
Basin N	4/29/2022	ISCO TWC	Dioxins/Furans	1,2,3,6,7,8-HxCDD	ND	pg/l	U	-	3.92
Basin P	3/12/2022	ISCO TWC	Dioxins/Furans	1,2,3,6,7,8-HxCDD	ND	pg/l	U	-	5.6
Basin P	4/3/2022	ISCO TWC	Dioxins/Furans	1,2,3,6,7,8-HxCDD	ND	pg/l	U	-	9.35
Basin P	4/29/2022	ISCO TWC	Dioxins/Furans	1,2,3,6,7,8-HxCDD	ND	pg/l	U	-	3.19

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin P	4/29/2022	ISCO TWC-DUP	Dioxins/Furans	1,2,3,6,7,8-HxCDD	ND	pg/l	U	-	6.93
Basin Q	11/6/2020	ISCO TWC	Dioxins/Furans	1,2,3,6,7,8-HxCDD	ND	pg/l	U	50.7	4.77
Basin Q	11/6/2020	ISCO TWC-DUP	Dioxins/Furans	1,2,3,6,7,8-HxCDD	ND	pg/l	U	50	5.64
Basin Q	11/13/2020	ISCO TWC	Dioxins/Furans	1,2,3,6,7,8-HxCDD	ND	pg/l	U	54.7	1.86
Basin Q	12/11/2020	ISCO TWC	Dioxins/Furans	1,2,3,6,7,8-HxCDD	ND	pg/l	U	54.2	4.94
Basin Q	10/10/2020	ISCO TWC	Dioxins/Furans	1,2,3,6,7,8-HxCDD	1.58	pg/l	J	45.9	0.973
Basin N	3/13/2022	ISCO TWC	Dioxins/Furans	1,2,3,6,7,8-HxCDF	ND	pg/l	U	-	5.92
Basin N	4/4/2022	ISCO TWC	Dioxins/Furans	1,2,3,6,7,8-HxCDF	ND	pg/l	U	-	6.16
Basin N	4/29/2022	ISCO TWC	Dioxins/Furans	1,2,3,6,7,8-HxCDF	ND	pg/l	U	-	3.66
Basin P	3/12/2022	ISCO TWC	Dioxins/Furans	1,2,3,6,7,8-HxCDF	ND	pg/l	U	-	4.67
Basin P	4/3/2022	ISCO TWC	Dioxins/Furans	1,2,3,6,7,8-HxCDF	ND	pg/l	U	-	10.8
Basin P	4/29/2022	ISCO TWC	Dioxins/Furans	1,2,3,6,7,8-HxCDF	ND	pg/l	U	-	3.08
Basin P	4/29/2022	ISCO TWC-DUP	Dioxins/Furans	1,2,3,6,7,8-HxCDF	ND	pg/l	U	-	3.34
Basin Q	11/6/2020	ISCO TWC-DUP	Dioxins/Furans	1,2,3,6,7,8-HxCDF	ND	pg/l	U	50	2.36
Basin Q	11/6/2020	ISCO TWC	Dioxins/Furans	1,2,3,6,7,8-HxCDF	ND	pg/l	U	50.7	2.35
Basin Q	11/13/2020	ISCO TWC	Dioxins/Furans	1,2,3,6,7,8-HxCDF	ND	pg/l	U	54.7	1.52
Basin Q	12/11/2020	ISCO TWC	Dioxins/Furans	1,2,3,6,7,8-HxCDF	ND	pg/l	U	54.2	2.43
Basin Q	10/10/2020	ISCO TWC	Dioxins/Furans	1,2,3,6,7,8-HxCDF	0.367	pg/l	J	45.9	0.364
Basin N	3/13/2022	ISCO TWC	Dioxins/Furans	1,2,3,7,8,9-HxCDD	ND	pg/l	U	-	4.38
Basin N	4/4/2022	ISCO TWC	Dioxins/Furans	1,2,3,7,8,9-HxCDD	ND	pg/l	U	-	10.5
Basin N	4/29/2022	ISCO TWC	Dioxins/Furans	1,2,3,7,8,9-HxCDD	ND	pg/l	U	-	4.33
Basin P	3/12/2022	ISCO TWC	Dioxins/Furans	1,2,3,7,8,9-HxCDD	ND	pg/l	U	-	6.18
Basin P	4/3/2022	ISCO TWC	Dioxins/Furans	1,2,3,7,8,9-HxCDD	ND	pg/l	U	-	10.3
Basin P	4/29/2022	ISCO TWC	Dioxins/Furans	1,2,3,7,8,9-HxCDD	ND	pg/l	U	-	3.52
Basin P	4/29/2022	ISCO TWC-DUP	Dioxins/Furans	1,2,3,7,8,9-HxCDD	ND	pg/l	U	-	7.64
Basin Q	11/6/2020	ISCO TWC	Dioxins/Furans	1,2,3,7,8,9-HxCDD	ND	pg/l	U	50.7	5.03
Basin Q	11/6/2020	ISCO TWC-DUP	Dioxins/Furans	1,2,3,7,8,9-HxCDD	ND	pg/l	U	50	5.88
Basin Q	11/13/2020	ISCO TWC	Dioxins/Furans	1,2,3,7,8,9-HxCDD	ND	pg/l	U	54.7	1.84
Basin Q	12/11/2020	ISCO TWC	Dioxins/Furans	1,2,3,7,8,9-HxCDD	ND	pg/l	U	54.2	4.94
Basin Q	10/10/2020	ISCO TWC	Dioxins/Furans	1,2,3,7,8,9-HxCDD	ND	pg/l	U	45.9	0.995
Basin N	3/13/2022	ISCO TWC	Dioxins/Furans	1,2,3,7,8,9-HxCDF	ND	pg/l	U	-	6.42
Basin N	4/4/2022	ISCO TWC	Dioxins/Furans	1,2,3,7,8,9-HxCDF	ND	pg/l	U	-	6.81
Basin N	4/29/2022	ISCO TWC	Dioxins/Furans	1,2,3,7,8,9-HxCDF	ND	pg/l	U	-	3.84

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin P	3/12/2022	ISCO TWC	Dioxins/Furans	1,2,3,7,8,9-HxCDF	ND	pg/l	U	-	5.73
Basin P	4/3/2022	ISCO TWC	Dioxins/Furans	1,2,3,7,8,9-HxCDF	ND	pg/l	U	-	11.9
Basin P	4/29/2022	ISCO TWC	Dioxins/Furans	1,2,3,7,8,9-HxCDF	ND	pg/l	U	-	3.25
Basin P	4/29/2022	ISCO TWC-DUP	Dioxins/Furans	1,2,3,7,8,9-HxCDF	ND	pg/l	U	-	3.78
Basin Q	11/6/2020	ISCO TWC-DUP	Dioxins/Furans	1,2,3,7,8,9-HxCDF	ND	pg/l	U	50	4.12
Basin Q	11/6/2020	ISCO TWC	Dioxins/Furans	1,2,3,7,8,9-HxCDF	ND	pg/l	U	50.7	4.34
Basin Q	11/13/2020	ISCO TWC	Dioxins/Furans	1,2,3,7,8,9-HxCDF	ND	pg/l	U	54.7	2.13
Basin Q	12/11/2020	ISCO TWC	Dioxins/Furans	1,2,3,7,8,9-HxCDF	ND	pg/l	U	54.2	3.06
Basin Q	10/10/2020	ISCO TWC	Dioxins/Furans	1,2,3,7,8,9-HxCDF	ND	pg/l	U	45.9	0.549
Basin N	3/13/2022	ISCO TWC	Dioxins/Furans	1,2,3,7,8-PeCDD	ND	pg/l	U	-	6.76
Basin N	4/4/2022	ISCO TWC	Dioxins/Furans	1,2,3,7,8-PeCDD	ND	pg/l	U	-	3.54
Basin N	4/29/2022	ISCO TWC	Dioxins/Furans	1,2,3,7,8-PeCDD	ND	pg/l	U	-	5.67
Basin P	3/12/2022	ISCO TWC	Dioxins/Furans	1,2,3,7,8-PeCDD	ND	pg/l	U	-	5.89
Basin P	4/3/2022	ISCO TWC	Dioxins/Furans	1,2,3,7,8-PeCDD	ND	pg/l	U	-	6.28
Basin P	4/29/2022	ISCO TWC	Dioxins/Furans	1,2,3,7,8-PeCDD	ND	pg/l	U	-	3.99
Basin P	4/29/2022	ISCO TWC-DUP	Dioxins/Furans	1,2,3,7,8-PeCDD	ND	pg/l	U	-	5.74
Basin Q	10/10/2020	ISCO TWC	Dioxins/Furans	1,2,3,7,8-PeCDD	0.973	pg/l	J	45.9	0.779
Basin Q	11/6/2020	ISCO TWC	Dioxins/Furans	1,2,3,7,8-PeCDD	ND	pg/l	U	50.7	3
Basin Q	11/6/2020	ISCO TWC-DUP	Dioxins/Furans	1,2,3,7,8-PeCDD	ND	pg/l	U	50	3.08
Basin Q	11/13/2020	ISCO TWC	Dioxins/Furans	1,2,3,7,8-PeCDD	ND	pg/l	U	54.7	1.29
Basin Q	12/11/2020	ISCO TWC	Dioxins/Furans	1,2,3,7,8-PeCDD	ND	pg/l	U	54.2	2.97
Basin N	3/13/2022	ISCO TWC	Dioxins/Furans	1,2,3,7,8-PeCDF	ND	pg/l	U	-	4.52
Basin N	4/4/2022	ISCO TWC	Dioxins/Furans	1,2,3,7,8-PeCDF	ND	pg/l	U	-	3.34
Basin N	4/29/2022	ISCO TWC	Dioxins/Furans	1,2,3,7,8-PeCDF	ND	pg/l	U	-	5.77
Basin P	3/12/2022	ISCO TWC	Dioxins/Furans	1,2,3,7,8-PeCDF	ND	pg/l	U	-	3.58
Basin P	4/3/2022	ISCO TWC	Dioxins/Furans	1,2,3,7,8-PeCDF	ND	pg/l	U	-	4.53
Basin P	4/29/2022	ISCO TWC	Dioxins/Furans	1,2,3,7,8-PeCDF	ND	pg/l	U	-	2.17
Basin P	4/29/2022	ISCO TWC-DUP	Dioxins/Furans	1,2,3,7,8-PeCDF	ND	pg/l	U	-	3.45
Basin Q	10/10/2020	ISCO TWC	Dioxins/Furans	1,2,3,7,8-PeCDF	0.698	pg/l	J	45.9	0.454
Basin Q	11/6/2020	ISCO TWC-DUP	Dioxins/Furans	1,2,3,7,8-PeCDF	ND	pg/l	U	50	2.98
Basin Q	11/6/2020	ISCO TWC	Dioxins/Furans	1,2,3,7,8-PeCDF	ND	pg/l	U	50.7	2.23
Basin Q	11/13/2020	ISCO TWC	Dioxins/Furans	1,2,3,7,8-PeCDF	ND	pg/l	U	54.7	1.17
Basin Q	12/11/2020	ISCO TWC	Dioxins/Furans	1,2,3,7,8-PeCDF	ND	pg/l	U	54.2	2.11

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin M	2/27/2018	Pumped Composite	PAHs	1-Methylnaphthalene	ND	µg/l	U	0.0377	0.0189
Basin M	3/14/2018	Pumped Composite	PAHs	1-Methylnaphthalene	0.0811	µg/l	=	0.0381	0.019
Basin M	3/26/2018	Pumped Composite	PAHs	1-Methylnaphthalene	ND	µg/l	U	0.0381	0.019
Basin Q	10/10/2020	ISCO TWC	PAHs	1-Methylnaphthalene	ND	µg/l	U	0.176	0.0879
Basin Q	11/6/2020	ISCO TWC-DUP	PAHs	1-Methylnaphthalene	ND	µg/l	U	0.168	0.0842
Basin Q	11/6/2020	ISCO TWC	PAHs	1-Methylnaphthalene	ND	µg/l	U	0.158	0.0792
Basin Q	11/13/2020	ISCO TWC	PAHs	1-Methylnaphthalene	ND	µg/l	U	0.158	0.0792
Basin Q	12/11/2020	ISCO TWC	PAHs	1-Methylnaphthalene	ND	µg/l	U	0.043	0.0215
Basin N	3/13/2022	ISCO TWC	Dioxins/Furans	2,3,4,6,7,8-HxCDF	ND	pg/l	U	-	5.92
Basin N	4/4/2022	ISCO TWC	Dioxins/Furans	2,3,4,6,7,8-HxCDF	ND	pg/l	U	-	6.97
Basin N	4/29/2022	ISCO TWC	Dioxins/Furans	2,3,4,6,7,8-HxCDF	ND	pg/l	U	-	4.04
Basin P	3/12/2022	ISCO TWC	Dioxins/Furans	2,3,4,6,7,8-HxCDF	ND	pg/l	U	-	5.23
Basin P	4/3/2022	ISCO TWC	Dioxins/Furans	2,3,4,6,7,8-HxCDF	ND	pg/l	U	-	12.5
Basin P	4/29/2022	ISCO TWC	Dioxins/Furans	2,3,4,6,7,8-HxCDF	ND	pg/l	U	-	3.55
Basin P	4/29/2022	ISCO TWC-DUP	Dioxins/Furans	2,3,4,6,7,8-HxCDF	ND	pg/l	U	-	3.8
Basin Q	11/6/2020	ISCO TWC	Dioxins/Furans	2,3,4,6,7,8-HxCDF	ND	pg/l	U	50.7	2.78
Basin Q	11/6/2020	ISCO TWC-DUP	Dioxins/Furans	2,3,4,6,7,8-HxCDF	ND	pg/l	U	50	2.52
Basin Q	11/13/2020	ISCO TWC	Dioxins/Furans	2,3,4,6,7,8-HxCDF	ND	pg/l	U	54.7	1.54
Basin Q	12/11/2020	ISCO TWC	Dioxins/Furans	2,3,4,6,7,8-HxCDF	ND	pg/l	U	54.2	2.56
Basin Q	10/10/2020	ISCO TWC	Dioxins/Furans	2,3,4,6,7,8-HxCDF	0.533	pg/l	J	45.9	0.393
Basin N	3/13/2022	ISCO TWC	Dioxins/Furans	2,3,4,7,8-PeCDF	ND	pg/l	U	-	4.74
Basin N	4/4/2022	ISCO TWC	Dioxins/Furans	2,3,4,7,8-PeCDF	ND	pg/l	U	-	3.22
Basin N	4/29/2022	ISCO TWC	Dioxins/Furans	2,3,4,7,8-PeCDF	ND	pg/l	U	-	5.47
Basin P	3/12/2022	ISCO TWC	Dioxins/Furans	2,3,4,7,8-PeCDF	ND	pg/l	U	-	3.66
Basin P	4/3/2022	ISCO TWC	Dioxins/Furans	2,3,4,7,8-PeCDF	ND	pg/l	U	-	4.47
Basin P	4/29/2022	ISCO TWC	Dioxins/Furans	2,3,4,7,8-PeCDF	ND	pg/l	U	-	2.11
Basin P	4/29/2022	ISCO TWC-DUP	Dioxins/Furans	2,3,4,7,8-PeCDF	ND	pg/l	U	-	3.16
Basin Q	10/10/2020	ISCO TWC	Dioxins/Furans	2,3,4,7,8-PeCDF	0.661	pg/l	J	45.9	0.424
Basin Q	11/6/2020	ISCO TWC-DUP	Dioxins/Furans	2,3,4,7,8-PeCDF	ND	pg/l	U	50	2.66
Basin Q	11/6/2020	ISCO TWC	Dioxins/Furans	2,3,4,7,8-PeCDF	ND	pg/l	U	50.7	2.17
Basin Q	11/13/2020	ISCO TWC	Dioxins/Furans	2,3,4,7,8-PeCDF	ND	pg/l	U	54.7	1.18
Basin Q	12/11/2020	ISCO TWC	Dioxins/Furans	2,3,4,7,8-PeCDF	ND	pg/l	U	54.2	2.04
Basin N	3/13/2022	ISCO TWC	Dioxins/Furans	2,3,7,8-TCDD	ND	pg/l	U	-	1.93

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin N	4/4/2022	ISCO TWC	Dioxins/Furans	2,3,7,8-TCDD	ND	pg/l	U	-	1.57
Basin N	4/29/2022	ISCO TWC	Dioxins/Furans	2,3,7,8-TCDD	ND	pg/l	U	-	1.83
Basin P	3/12/2022	ISCO TWC	Dioxins/Furans	2,3,7,8-TCDD	ND	pg/l	U	-	2.45
Basin P	4/3/2022	ISCO TWC	Dioxins/Furans	2,3,7,8-TCDD	ND	pg/l	U	-	1.76
Basin P	4/29/2022	ISCO TWC	Dioxins/Furans	2,3,7,8-TCDD	ND	pg/l	U	-	1.58
Basin P	4/29/2022	ISCO TWC-DUP	Dioxins/Furans	2,3,7,8-TCDD	ND	pg/l	U	-	1.8
Basin Q	10/10/2020	ISCO TWC	Dioxins/Furans	2,3,7,8-TCDD	ND	pg/l	U	9.18	1.16
Basin Q	11/6/2020	ISCO TWC-DUP	Dioxins/Furans	2,3,7,8-TCDD	ND	pg/l	U	10	2.88
Basin Q	11/6/2020	ISCO TWC	Dioxins/Furans	2,3,7,8-TCDD	ND	pg/l	U	10.1	3.83
Basin Q	11/13/2020	ISCO TWC	Dioxins/Furans	2,3,7,8-TCDD	ND	pg/l	U	10.9	1.11
Basin Q	12/11/2020	ISCO TWC	Dioxins/Furans	2,3,7,8-TCDD	ND	pg/l	U	10.8	2.82
Basin N	3/13/2022	ISCO TWC	Dioxins/Furans	2,3,7,8-TCDF	ND	pg/l	U	-	1.27
Basin N	4/4/2022	ISCO TWC	Dioxins/Furans	2,3,7,8-TCDF	ND	pg/l	U	-	0.808
Basin N	4/29/2022	ISCO TWC	Dioxins/Furans	2,3,7,8-TCDF	ND	pg/l	U	-	1.9
Basin P	3/12/2022	ISCO TWC	Dioxins/Furans	2,3,7,8-TCDF	ND	pg/l	U	-	1.59
Basin P	4/3/2022	ISCO TWC	Dioxins/Furans	2,3,7,8-TCDF	ND	pg/l	U	-	2.32
Basin P	4/29/2022	ISCO TWC	Dioxins/Furans	2,3,7,8-TCDF	ND	pg/l	U	-	1.38
Basin P	4/29/2022	ISCO TWC-DUP	Dioxins/Furans	2,3,7,8-TCDF	ND	pg/l	U	-	1.91
Basin Q	10/10/2020	ISCO TWC	Dioxins/Furans	2,3,7,8-TCDF	ND	pg/l	U	9.18	1.63
Basin Q	11/6/2020	ISCO TWC	Dioxins/Furans	2,3,7,8-TCDF	ND	pg/l	U	10.1	4
Basin Q	11/6/2020	ISCO TWC-DUP	Dioxins/Furans	2,3,7,8-TCDF	ND	pg/l	U	10	3.48
Basin Q	11/13/2020	ISCO TWC	Dioxins/Furans	2,3,7,8-TCDF	ND	pg/l	U	10.9	1.36
Basin Q	12/11/2020	ISCO TWC	Dioxins/Furans	2,3,7,8-TCDF	ND	pg/l	U	10.8	3.23
Basin L	12/26/2022	Grab, Post-SCM	PAHs	2-Methylnaphthalene	ND	µg/l	U	-	0.0194
Basin L	1/13/2023	Grab, Post-SCM	PAHs	2-Methylnaphthalene	0.0294	µg/l	J	-	-
Basin L	2/13/2023	Grab, Post-SCM	PAHs	2-Methylnaphthalene	ND	µg/l	UJ	-	0.02
Basin L	3/13/2023	Grab, Post-SCM	PAHs	2-Methylnaphthalene	ND	µg/l	U	-	0.00952
Basin M	10/23/2010	Grab	PAHs	2-Methylnaphthalene	ND	µg/l	U	-	0.012
Basin M	11/6/2010	Grab	PAHs	2-Methylnaphthalene	0.013	µg/l	J	-	-
Basin M	2/12/2011	Grab	PAHs	2-Methylnaphthalene	0.066	µg/l	=	-	-
Basin M	11/11/2012	ISCO Composite	PAHs	2-Methylnaphthalene	0.0071	µg/l	J	-	-
Basin M	2/22/2013	ISCO Composite	PAHs	2-Methylnaphthalene	0.0072	µg/l	=	-	-
Basin M	4/13/2015	Composite Drum	PAHs	2-Methylnaphthalene	0.0083	µg/l	J	0.02	0.0023

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin M	12/3/2015	Composite Drum	PAHs	2-Methylnaphthalene	ND	µg/l	U	0.0381	0.019
Basin M	12/17/2015	Composite Drum	PAHs	2-Methylnaphthalene	ND	µg/l	U	0.0381	0.313
Basin M	1/25/2016	Composite Drum	PAHs	2-Methylnaphthalene	ND	µg/l	U	0.0381	0.338
Basin M	2/27/2018	Pumped Composite	PAHs	2-Methylnaphthalene	ND	µg/l	U	0.0377	0.0189
Basin M	3/14/2018	Pumped Composite	PAHs	2-Methylnaphthalene	0.146	µg/l	=	0.0381	0.019
Basin M	3/26/2018	Pumped Composite	PAHs	2-Methylnaphthalene	ND	µg/l	U	0.0381	0.019
Basin N	3/13/2022	ISCO TWC	PAHs	2-Methylnaphthalene	ND	µg/l	U	0.0713	0.0357
Basin N	4/4/2022	ISCO TWC	PAHs	2-Methylnaphthalene	ND	µg/l	U	0.0412	0.0206
Basin N	4/30/2022	ISCO TWC	PAHs	2-Methylnaphthalene	ND	µg/l	U	0.0639	0.0319
Basin P	4/29/2022	ISCO TWC-DUP	PAHs	2-Methylnaphthalene	ND	µg/l	U	0.0656	0.0328
Basin P	3/12/2022	ISCO TWC	PAHs	2-Methylnaphthalene	ND	µg/l	U	0.0665	0.0333
Basin P	4/3/2022	ISCO TWC	PAHs	2-Methylnaphthalene	ND	µg/l	U	0.0738	0.0369
Basin P	4/29/2022	ISCO TWC	PAHs	2-Methylnaphthalene	ND	µg/l	U	0.0634	0.0317
Basin Q	10/10/2020	ISCO TWC	PAHs	2-Methylnaphthalene	ND	µg/l	U	0.176	0.0879
Basin Q	11/6/2020	ISCO TWC-DUP	PAHs	2-Methylnaphthalene	ND	µg/l	U	0.168	0.0842
Basin Q	11/6/2020	ISCO TWC	PAHs	2-Methylnaphthalene	ND	µg/l	U	0.158	0.0792
Basin Q	11/13/2020	ISCO TWC	PAHs	2-Methylnaphthalene	ND	µg/l	U	0.158	0.0792
Basin Q	12/11/2020	ISCO TWC	PAHs	2-Methylnaphthalene	ND	µg/l	U	0.043	0.0215
Basin R	11/16/2007	ISCO Composite	PAHs	2-Methylnaphthalene	ND	µg/l	U	-	0.0024
Basin R	11/16/2007	ISCO Composite-DUP	PAHs	2-Methylnaphthalene	ND	µg/l	U	-	0.0024
Basin L	12/26/2022	Grab, Post-SCM	PAHs	Acenaphthene	ND	µg/l	U	-	0.00971
Basin L	1/13/2023	Grab, Post-SCM	PAHs	Acenaphthene	ND	µg/l	U	-	0.00962
Basin L	2/13/2023	Grab, Post-SCM	PAHs	Acenaphthene	ND	µg/l	UJ	-	0.01
Basin L	3/13/2023	Grab, Post-SCM	PAHs	Acenaphthene	ND	µg/l	U	-	0.00952
Basin M	10/23/2010	Grab	PAHs	Acenaphthene	0.017	µg/l	=	-	-
Basin M	11/6/2010	Grab	PAHs	Acenaphthene	0.014	µg/l	J	-	-
Basin M	2/12/2011	Grab	PAHs	Acenaphthene	0.093	µg/l	=	-	-
Basin M	11/11/2012	ISCO Composite	PAHs	Acenaphthene	0.011	µg/l	J	-	-
Basin M	2/22/2013	ISCO Composite	PAHs	Acenaphthene	0.016	µg/l	=	-	-
Basin M	3/8/2014	Grab	PAHs	Acenaphthene	0.051	µg/l	=	-	-
Basin M	3/9/2014	ISCO Composite	PAHs	Acenaphthene	0.088	µg/l	=	-	-
Basin M	4/13/2015	Composite Drum	PAHs	Acenaphthene	0.012	µg/l	J	0.02	0.0044
Basin M	12/3/2015	Composite Drum	PAHs	Acenaphthene	0.0428	µg/l	=	0.313	0.156

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin M	12/17/2015	Composite Drum	PAHs	Acenaphthene	ND	µg/l	U	0.313	0.156
Basin M	1/25/2016	Composite Drum	PAHs	Acenaphthene	ND	µg/l	U	0.313	0.169
Basin M	2/27/2018	Pumped Composite	PAHs	Acenaphthene	0.0201	µg/l	=	0.0189	0.00943
Basin M	3/14/2018	Pumped Composite	PAHs	Acenaphthene	ND	µg/l	U	0.019	0.0099
Basin M	3/26/2018	Pumped Composite	PAHs	Acenaphthene	0.0111	µg/l	J	0.019	0.00952
Basin N	3/13/2022	ISCO TWC	PAHs	Acenaphthene	ND	µg/l	U	0.0357	0.0357
Basin N	4/4/2022	ISCO TWC	PAHs	Acenaphthene	ND	µg/l	U	0.0206	0.0103
Basin N	4/30/2022	ISCO TWC	PAHs	Acenaphthene	ND	µg/l	U	0.0319	0.016
Basin P	4/29/2022	ISCO TWC-DUP	PAHs	Acenaphthene	ND	µg/l	U	0.0328	0.0164
Basin P	3/12/2022	ISCO TWC	PAHs	Acenaphthene	ND	µg/l	U	0.0333	0.0166
Basin P	4/3/2022	ISCO TWC	PAHs	Acenaphthene	ND	µg/l	U	0.0369	0.0185
Basin P	4/29/2022	ISCO TWC	PAHs	Acenaphthene	ND	µg/l	U	0.0317	0.0158
Basin Q	10/10/2020	ISCO TWC	PAHs	Acenaphthene	ND	µg/l	U	0.0879	0.044
Basin Q	11/6/2020	ISCO TWC	PAHs	Acenaphthene	ND	µg/l	U	0.0792	0.0396
Basin Q	11/6/2020	ISCO TWC-DUP	PAHs	Acenaphthene	ND	µg/l	U	0.0842	0.0421
Basin Q	11/13/2020	ISCO TWC	PAHs	Acenaphthene	ND	µg/l	U	0.0792	0.0396
Basin Q	12/11/2020	ISCO TWC	PAHs	Acenaphthene	ND	µg/l	U	0.0215	0.0108
Basin R	11/16/2007	ISCO Composite	PAHs	Acenaphthene	ND	µg/l	U	-	0.0046
Basin R	11/16/2007	ISCO Composite-DUP	PAHs	Acenaphthene	ND	µg/l	U	-	0.0046
Basin L	12/26/2022	Grab, Post-SCM	PAHs	Acenaphthylene	ND	µg/l	U	-	0.00971
Basin L	1/13/2023	Grab, Post-SCM	PAHs	Acenaphthylene	ND	µg/l	U	-	0.00962
Basin L	2/13/2023	Grab, Post-SCM	PAHs	Acenaphthylene	ND	µg/l	UJ	-	0.01
Basin L	3/13/2023	Grab, Post-SCM	PAHs	Acenaphthylene	ND	µg/l	U	-	0.00952
Basin M	10/23/2010	Grab	PAHs	Acenaphthylene	0.033	µg/l	=	-	-
Basin M	11/6/2010	Grab	PAHs	Acenaphthylene	0.044	µg/l	=	-	-
Basin M	2/12/2011	Grab	PAHs	Acenaphthylene	0.1	µg/l	=	-	-
Basin M	11/11/2012	ISCO Composite	PAHs	Acenaphthylene	0.032	µg/l	=	-	-
Basin M	2/22/2013	ISCO Composite	PAHs	Acenaphthylene	0.047	µg/l	=	-	-
Basin M	3/8/2014	Grab	PAHs	Acenaphthylene	0.13	µg/l	=	-	-
Basin M	3/9/2014	ISCO Composite	PAHs	Acenaphthylene	0.2	µg/l	=	-	-
Basin M	4/13/2015	Composite Drum	PAHs	Acenaphthylene	0.096	µg/l	=	0.02	0.0034
Basin M	12/3/2015	Composite Drum	PAHs	Acenaphthylene	0.195	µg/l	=	0.338	0.169
Basin M	12/17/2015	Composite Drum	PAHs	Acenaphthylene	0.34	µg/l	=	0.338	0.169

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin M	1/25/2016	Composite Drum	PAHs	Acenaphthylene	0.266	µg/l	=	0.338	0.169
Basin M	2/27/2018	Pumped Composite	PAHs	Acenaphthylene	0.0744	µg/l	=	0.0189	0.00943
Basin M	3/14/2018	Pumped Composite	PAHs	Acenaphthylene	0.0344	µg/l	=	0.019	0.00952
Basin M	3/26/2018	Pumped Composite	PAHs	Acenaphthylene	0.0572	µg/l	=	0.019	0.00952
Basin N	3/13/2022	ISCO TWC	PAHs	Acenaphthylene	ND	µg/l	U	0.0357	0.0178
Basin N	4/4/2022	ISCO TWC	PAHs	Acenaphthylene	ND	µg/l	U	0.0206	0.0103
Basin N	4/30/2022	ISCO TWC	PAHs	Acenaphthylene	ND	µg/l	UJ	0.0319	0.016
Basin P	4/29/2022	ISCO TWC-DUP	PAHs	Acenaphthylene	ND	µg/l	UJ	0.0328	0.0164
Basin P	3/12/2022	ISCO TWC	PAHs	Acenaphthylene	ND	µg/l	U	0.0333	0.0166
Basin P	4/3/2022	ISCO TWC	PAHs	Acenaphthylene	ND	µg/l	UJ	0.0369	0.0185
Basin P	4/29/2022	ISCO TWC	PAHs	Acenaphthylene	ND	µg/l	UJ	0.0317	0.0158
Basin Q	10/10/2020	ISCO TWC	PAHs	Acenaphthylene	ND	µg/l	U	0.0879	0.044
Basin Q	11/6/2020	ISCO TWC-DUP	PAHs	Acenaphthylene	ND	µg/l	U	0.0842	0.0421
Basin Q	11/6/2020	ISCO TWC	PAHs	Acenaphthylene	ND	µg/l	U	0.0792	0.0396
Basin Q	11/13/2020	ISCO TWC	PAHs	Acenaphthylene	ND	µg/l	U	0.0792	0.0396
Basin Q	12/11/2020	ISCO TWC	PAHs	Acenaphthylene	ND	µg/l	U	0.0215	0.0108
Basin R	11/16/2007	ISCO Composite	PAHs	Acenaphthylene	ND	µg/l	U	-	0.0036
Basin R	11/16/2007	ISCO Composite-DUP	PAHs	Acenaphthylene	ND	µg/l	U	-	0.0036
Basin M	10/23/2010	Grab	Metals	Aluminum	1790	µg/l	=	-	-
Basin M	11/6/2010	Grab	Metals	Aluminum	2110	µg/l	=	-	-
Basin M	2/12/2011	Grab	Metals	Aluminum	3130	µg/l	=	-	-
Basin M	11/11/2012	ISCO Composite	Metals	Aluminum	572	µg/l	=	-	-
Basin M	2/22/2013	ISCO Composite	Metals	Aluminum	1510	µg/l	=	-	-
Basin M	2/27/2018	Pumped Composite	Metals	Aluminum	1450	µg/l	=	250	125
Basin M	3/14/2018	Pumped Composite	Metals	Aluminum	1870	µg/l	=	50	25
Basin M	3/26/2018	Pumped Composite	Metals	Aluminum	1010	µg/l	=	50	25
Basin R	11/16/2007	ISCO Composite	Metals	Aluminum	193	µg/l	J	-	-
Basin R	11/16/2007	ISCO Composite-DUP	Metals	Aluminum	89.5	µg/l	J	-	-
Basin L	12/26/2022	Grab, Post-SCM	PAHs	Anthracene	ND	µg/l	U	-	0.00971
Basin L	1/13/2023	Grab, Post-SCM	PAHs	Anthracene	ND	µg/l	U	-	0.00962
Basin L	2/13/2023	Grab, Post-SCM	PAHs	Anthracene	ND	µg/l	U	-	0.01
Basin L	3/13/2023	Grab, Post-SCM	PAHs	Anthracene	ND	µg/l	U	-	-
Basin M	10/23/2010	Grab	PAHs	Anthracene	0.16	µg/l	=	-	-

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin M	11/6/2010	Grab	PAHs	Anthracene	0.15	µg/l	=	-	-
Basin M	2/12/2011	Grab	PAHs	Anthracene	0.21	µg/l	=	-	-
Basin M	11/11/2012	ISCO Composite	PAHs	Anthracene	0.07	µg/l	=	-	-
Basin M	2/22/2013	ISCO Composite	PAHs	Anthracene	0.074	µg/l	=	-	-
Basin M	3/8/2014	Grab	PAHs	Anthracene	0.27	µg/l	=	-	-
Basin M	3/9/2014	ISCO Composite	PAHs	Anthracene	0.47	µg/l	=	-	-
Basin M	4/13/2015	Composite Drum	PAHs	Anthracene	0.25	µg/l	=	0.02	0.0036
Basin M	12/3/2015	Composite Drum	PAHs	Anthracene	0.638	µg/l	=	0.313	0.156
Basin M	12/17/2015	Composite Drum	PAHs	Anthracene	0.535	µg/l	=	0.313	0.156
Basin M	1/25/2016	Composite Drum	PAHs	Anthracene	0.389	µg/l	=	0.313	0.156
Basin M	2/27/2018	Pumped Composite	PAHs	Anthracene	0.249	µg/l	=	0.0189	0.00943
Basin M	3/14/2018	Pumped Composite	PAHs	Anthracene	0.109	µg/l	=	0.019	0.00952
Basin M	3/26/2018	Pumped Composite	PAHs	Anthracene	0.205	µg/l	=	0.019	0.00952
Basin N	3/13/2022	ISCO TWC	PAHs	Anthracene	0.0374	µg/l	=	0.0357	0.0178
Basin N	4/4/2022	ISCO TWC	PAHs	Anthracene	ND	µg/l	U	0.0206	0.0103
Basin N	4/30/2022	ISCO TWC	PAHs	Anthracene	0.0279	µg/l	J	0.0319	0.016
Basin P	4/29/2022	ISCO TWC-DUP	PAHs	Anthracene	ND	µg/l	U	0.0328	0.0164
Basin P	3/12/2022	ISCO TWC	PAHs	Anthracene	ND	µg/l	U	0.0333	0.0166
Basin P	4/3/2022	ISCO TWC	PAHs	Anthracene	ND	µg/l	U	0.0369	0.0185
Basin P	4/29/2022	ISCO TWC	PAHs	Anthracene	ND	µg/l	U	0.0317	0.0158
Basin Q	10/10/2020	ISCO TWC	PAHs	Anthracene	0.0581	µg/l	J	0.0879	0.044
Basin Q	11/6/2020	ISCO TWC-DUP	PAHs	Anthracene	0.101	µg/l	=	0.0842	0.0421
Basin Q	11/6/2020	ISCO TWC	PAHs	Anthracene	0.1	µg/l	=	0.0792	0.0396
Basin Q	11/13/2020	ISCO TWC	PAHs	Anthracene	ND	µg/l	U	0.0792	0.0396
Basin Q	12/11/2020	ISCO TWC	PAHs	Anthracene	0.0474	µg/l	=	0.0215	0.0108
Basin R	11/16/2007	ISCO Composite-DUP	PAHs	Anthracene	ND	µg/l	U	-	0.0038
Basin R	11/16/2007	ISCO Composite	PAHs	Anthracene	ND	µg/l	U	-	0.0038
Basin M	10/23/2010	Grab	Metals	Antimony	2.4	µg/l	=	-	-
Basin M	11/6/2010	Grab	Metals	Antimony	1.6	µg/l	=	-	-
Basin M	2/12/2011	Grab	Metals	Antimony	0.89	µg/l	=	-	-
Basin M	11/11/2012	ISCO Composite	Metals	Antimony	0.49	µg/l	=	-	-
Basin M	2/22/2013	ISCO Composite	Metals	Antimony	0.491	µg/l	=	-	-
Basin R	11/16/2007	ISCO Composite	Metals	Antimony	0.628	µg/l	=	-	-

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin R	11/16/2007	ISCO Composite-DUP	Metals	Antimony	0.497	µg/l	=	-	-
Basin M	10/23/2010		PCBs	Aroclor 1016	ND	µg/l	U	-	0.01
Basin M	11/6/2010		PCBs	Aroclor 1016	ND	µg/l	U	-	0.01
Basin M	2/12/2011		PCBs	Aroclor 1016	ND	µg/l	U	-	0.01
Basin M	11/11/2012		PCBs	Aroclor 1016	ND	µg/l	U	-	0.0023
Basin M	2/22/2013		PCBs	Aroclor 1016	ND	µg/l	U	-	0.011
Basin Q	10/23/2010		PCBs	Aroclor 1016	ND	µg/l	U	-	0.01
Basin Q	2/12/2011		PCBs	Aroclor 1016	ND	µg/l	U	-	0.01
Basin Q	5/11/2011		PCBs	Aroclor 1016	ND	µg/l	U	-	0.01
Basin R	11/16/2007	Dup1	PCBs	Aroclor 1016	ND	µg/l	U	-	0.001
Basin R	11/16/2007		PCBs	Aroclor 1016	ND	µg/l	U	-	0.0011
Basin M	10/23/2010		PCBs	Aroclor 1221	ND	µg/l	U	-	0.01
Basin M	11/6/2010		PCBs	Aroclor 1221	ND	µg/l	U	-	0.01
Basin M	2/12/2011		PCBs	Aroclor 1221	ND	µg/l	U	-	0.01
Basin M	11/11/2012		PCBs	Aroclor 1221	ND	µg/l	U	-	0.0023
Basin M	2/22/2013		PCBs	Aroclor 1221	ND	µg/l	U	-	0.0065
Basin Q	10/23/2010		PCBs	Aroclor 1221	ND	µg/l	U	-	0.01
Basin Q	2/12/2011		PCBs	Aroclor 1221	ND	µg/l	U	-	0.01
Basin Q	5/11/2011		PCBs	Aroclor 1221	ND	µg/l	U	-	0.01
Basin R	11/16/2007	Dup1	PCBs	Aroclor 1221	ND	µg/l	U	-	0.001
Basin R	11/16/2007		PCBs	Aroclor 1221	ND	µg/l	U	-	0.0011
Basin M	10/23/2010		PCBs	Aroclor 1232	ND	µg/l	U	-	0.01
Basin M	11/6/2010		PCBs	Aroclor 1232	ND	µg/l	U	-	0.01
Basin M	2/12/2011		PCBs	Aroclor 1232	ND	µg/l	U	-	0.01
Basin M	11/11/2012		PCBs	Aroclor 1232	ND	µg/l	U	-	0.0023
Basin M	2/22/2013		PCBs	Aroclor 1232	ND	µg/l	U	-	0.02
Basin Q	10/23/2010		PCBs	Aroclor 1232	ND	µg/l	U	-	0.01
Basin Q	2/12/2011		PCBs	Aroclor 1232	ND	µg/l	U	-	0.01
Basin Q	5/11/2011		PCBs	Aroclor 1232	ND	µg/l	U	-	0.01
Basin R	11/16/2007		PCBs	Aroclor 1232	ND	µg/l	U	-	0.0011
Basin R	11/16/2007	Dup1	PCBs	Aroclor 1232	ND	µg/l	U	-	0.001
Basin M	10/23/2010		PCBs	Aroclor 1242	ND	µg/l	U	-	0.01
Basin M	11/6/2010		PCBs	Aroclor 1242	ND	µg/l	U	-	0.01

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin M	2/12/2011		PCBs	Aroclor 1242	ND	µg/l	U	-	0.01
Basin M	11/11/2012		PCBs	Aroclor 1242	ND	µg/l	U	-	0.0023
Basin M	2/22/2013		PCBs	Aroclor 1242	ND	µg/l	U	-	0.017
Basin Q	10/23/2010		PCBs	Aroclor 1242	ND	µg/l	U	-	0.01
Basin Q	2/12/2011		PCBs	Aroclor 1242	ND	µg/l	U	-	0.01
Basin Q	5/11/2011		PCBs	Aroclor 1242	ND	µg/l	U	-	0.01
Basin R	11/16/2007		PCBs	Aroclor 1242	0.015	µg/l	=	-	-
Basin R	11/16/2007	Dup1	PCBs	Aroclor 1242	0.016	µg/l	=	-	-
Basin M	10/23/2010		PCBs	Aroclor 1248	ND	µg/l	U	-	0.01
Basin M	11/6/2010		PCBs	Aroclor 1248	ND	µg/l	U	-	0.01
Basin M	2/12/2011		PCBs	Aroclor 1248	ND	µg/l	U	-	0.01
Basin M	11/11/2012		PCBs	Aroclor 1248	ND	µg/l	U	-	0.0023
Basin M	2/22/2013		PCBs	Aroclor 1248	ND	µg/l	U	-	0.011
Basin Q	10/23/2010		PCBs	Aroclor 1248	ND	µg/l	U	-	0.01
Basin Q	2/12/2011		PCBs	Aroclor 1248	0.013	µg/l	=	-	-
Basin Q	5/11/2011		PCBs	Aroclor 1248	ND	µg/l	U	-	0.02
Basin R	11/16/2007		PCBs	Aroclor 1248	ND	µg/l	U	-	0.0011
Basin R	11/16/2007	Dup1	PCBs	Aroclor 1248	ND	µg/l	U	-	0.001
Basin M	10/23/2010		PCBs	Aroclor 1254	ND	µg/l	U	-	0.01
Basin M	11/6/2010		PCBs	Aroclor 1254	ND	µg/l	U	-	0.01
Basin M	2/12/2011		PCBs	Aroclor 1254	0.012	µg/l	=	-	-
Basin M	11/11/2012		PCBs	Aroclor 1254	ND	µg/l	U	-	0.0023
Basin M	2/22/2013		PCBs	Aroclor 1254	0.017	µg/l	=	-	-
Basin Q	10/23/2010		PCBs	Aroclor 1254	ND	µg/l	U	-	0.01
Basin Q	2/12/2011		PCBs	Aroclor 1254	0.012	µg/l	=	-	-
Basin Q	5/11/2011		PCBs	Aroclor 1254	0.038	µg/l	=	-	-
Basin R	11/16/2007	Dup1	PCBs	Aroclor 1254	ND	µg/l	U	-	0.001
Basin R	11/16/2007		PCBs	Aroclor 1254	ND	µg/l	U	-	0.0011
Basin M	10/23/2010		PCBs	Aroclor 1260	0.026	µg/l	J	-	-
Basin M	11/6/2010		PCBs	Aroclor 1260	0.012	µg/l	=	-	-
Basin M	2/12/2011		PCBs	Aroclor 1260	0.021	µg/l	=	-	-
Basin M	11/11/2012		PCBs	Aroclor 1260	0.0084	µg/l	=	-	-
Basin M	2/22/2013		PCBs	Aroclor 1260	0.027	µg/l	=	-	-

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin Q	10/23/2010		PCBs	Aroclor 1260	ND	µg/l	U	-	0.01
Basin Q	2/12/2011		PCBs	Aroclor 1260	ND	µg/l	U	-	0.01
Basin Q	5/11/2011		PCBs	Aroclor 1260	ND	µg/l	U	-	0.01
Basin R	11/16/2007		PCBs	Aroclor 1260	ND	µg/l	U	-	0.0011
Basin R	11/16/2007	Dup1	PCBs	Aroclor 1260	ND	µg/l	U	-	0.001
Basin M	10/23/2010		PCBs	Aroclor 1262	ND	µg/l	U	-	0.01
Basin M	11/6/2010		PCBs	Aroclor 1262	ND	µg/l	U	-	0.01
Basin M	2/12/2011		PCBs	Aroclor 1262	ND	µg/l	U	-	0.01
Basin M	11/11/2012		PCBs	Aroclor 1262	ND	µg/l	U	-	0.0023
Basin M	2/22/2013		PCBs	Aroclor 1262	ND	µg/l	U	-	0.0022
Basin Q	10/23/2010		PCBs	Aroclor 1262	ND	µg/l	U	-	0.01
Basin Q	2/12/2011		PCBs	Aroclor 1262	ND	µg/l	U	-	0.01
Basin Q	5/11/2011		PCBs	Aroclor 1262	ND	µg/l	U	-	0.01
Basin R	11/16/2007	Dup1	PCBs	Aroclor 1262	ND	µg/l	U	-	0.001
Basin R	11/16/2007		PCBs	Aroclor 1262	ND	µg/l	U	-	0.0011
Basin M	10/23/2010		PCBs	Aroclor 1268	ND	µg/l	U	-	0.01
Basin M	11/6/2010		PCBs	Aroclor 1268	ND	µg/l	U	-	0.01
Basin M	2/12/2011		PCBs	Aroclor 1268	ND	µg/l	U	-	0.01
Basin M	11/11/2012		PCBs	Aroclor 1268	ND	µg/l	U	-	0.0023
Basin M	2/22/2013		PCBs	Aroclor 1268	ND	µg/l	U	-	0.0022
Basin Q	10/23/2010		PCBs	Aroclor 1268	ND	µg/l	U	-	0.01
Basin Q	2/12/2011		PCBs	Aroclor 1268	ND	µg/l	U	-	0.01
Basin Q	5/11/2011		PCBs	Aroclor 1268	ND	µg/l	U	-	0.01
Basin R	11/16/2007	Dup1	PCBs	Aroclor 1268	ND	µg/l	U	-	0.001
Basin R	11/16/2007		PCBs	Aroclor 1268	ND	µg/l	U	-	0.0011
Basin M	10/23/2010	Grab	Metals	Arsenic	15.8	µg/l	=	-	-
Basin M	11/6/2010	Grab	Metals	Arsenic	6.9	µg/l	=	-	-
Basin M	2/12/2011	Grab	Metals	Arsenic	3.3	µg/l	=	-	-
Basin M	11/11/2012	ISCO Composite	Metals	Arsenic	0.956	µg/l	=	-	-
Basin M	2/22/2013	ISCO Composite	Metals	Arsenic	0.545	µg/l	=	-	-
Basin M	3/8/2014	Grab	Metals	Arsenic	0.695	µg/l	=	-	-
Basin M	3/9/2014	ISCO Composite	Metals	Arsenic	1.18	µg/l	=	-	-
Basin M	4/13/2015	21-day composite	Metals	Arsenic	1.99	µg/l	=	-	-

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin M	6/25/2015	73-day composite	Metals	Arsenic	2.36	µg/l	=	0.2	0.03
Basin M	12/3/2015	54-day composite	Metals	Arsenic	4.6	µg/l	=	-	-
Basin M	12/17/2015	14-day composite	Metals	Arsenic	1.8	µg/l	=	-	-
Basin M	1/25/2016	39-day composite	Metals	Arsenic	1.8	µg/l	=	0.1	0.015
Basin R	11/16/2007	ISCO Composite	Metals	Arsenic	0.18	µg/l	=	-	-
Basin R	11/16/2007	ISCO Composite-DUP	Metals	Arsenic	0.19	µg/l	=	-	-
Basin M	10/23/2010		Phthalates	BEHP	2	µg/l	J	-	-
Basin M	11/6/2010		Phthalates	BEHP	ND	µg/l	U	-	0.96
Basin M	2/12/2011		Phthalates	BEHP	ND	µg/l	U	-	1.1
Basin Q	10/10/2020	ISCO TWC	Phthalates	BEHP	ND	µg/l	U	1.76	0.879
Basin Q	11/6/2020	ISCO TWC	Phthalates	BEHP	ND	µg/l	U	1.58	0.792
Basin Q	11/6/2020	ISCO TWC-DUP	Phthalates	BEHP	ND	µg/l	U	1.68	0.842
Basin Q	11/13/2020	ISCO TWC	Phthalates	BEHP	ND	µg/l	U	1.58	0.792
Basin Q	12/11/2020	ISCO TWC	Phthalates	BEHP	ND	µg/l	U	0.43	0.215
Basin R	11/16/2007		Phthalates	BEHP	1.7	µg/l	=	-	-
Basin L	12/26/2022	Grab, Post-SCM	PAHs	Benz(a)anthracene	0.0185	µg/l	J	-	-
Basin L	1/13/2023	Grab, Post-SCM	PAHs	Benz(a)anthracene	ND	µg/l	U	-	0.00962
Basin L	2/13/2023	Grab, Post-SCM	PAHs	Benz(a)anthracene	0.015	µg/l	J	-	-
Basin L	3/13/2023	Grab, Post-SCM	PAHs	Benz(a)anthracene	ND	µg/l	U	-	0.00952
Basin M	10/23/2010	Grab	PAHs	Benz[a]anthracene	0.056	µg/l	=	-	-
Basin M	11/6/2010	Grab	PAHs	Benz[a]anthracene	0.087	µg/l	=	-	-
Basin M	2/12/2011	Grab	PAHs	Benz[a]anthracene	0.45	µg/l	=	-	-
Basin M	11/11/2012	ISCO Composite	PAHs	Benz[a]anthracene	0.066	µg/l	=	-	-
Basin M	2/22/2013	ISCO Composite	PAHs	Benz[a]anthracene	0.15	µg/l	=	-	-
Basin M	3/8/2014	Grab	PAHs	Benz[a]anthracene	0.34	µg/l	=	-	-
Basin M	3/9/2014	ISCO Composite	PAHs	Benz[a]anthracene	0.81	µg/l	=	-	-
Basin M	4/13/2015	Composite Drum	PAHs	Benz[a]anthracene	0.14	µg/l	=	0.02	0.0026
Basin M	12/3/2015	Composite Drum	PAHs	Benz[a]anthracene	0.462	µg/l	J	0.156	0.0782
Basin M	12/17/2015	Composite Drum	PAHs	Benz[a]anthracene	1.23	µg/l	J	0.156	0.0782
Basin M	1/25/2016	Composite Drum	PAHs	Benz[a]anthracene	0.414	µg/l	J	0.156	0.0782
Basin M	2/27/2018	Pumped Composite	PAHs	Benz[a]anthracene	0.157	µg/l	J	0.0189	0.00943
Basin M	3/14/2018	Pumped Composite	PAHs	Benz[a]anthracene	0.0603	µg/l	=	0.019	0.00952
Basin M	3/26/2018	Pumped Composite	PAHs	Benz[a]anthracene	0.0842	µg/l	J	0.019	0.00952

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin N	3/13/2022	ISCO TWC	PAHs	Benz[a]anthracene	0.0169	µg/l	J	0.0178	0.00892
Basin N	4/4/2022	ISCO TWC	PAHs	Benz[a]anthracene	0.0158	µg/l	J	0.0206	0.0103
Basin N	4/30/2022	ISCO TWC	PAHs	Benz[a]anthracene	0.00838	µg/l	J	0.016	0.00799
Basin P	4/29/2022	ISCO TWC-DUP	PAHs	Benz[a]anthracene	0.0102	µg/l	J	0.0164	0.0082
Basin P	3/12/2022	ISCO TWC	PAHs	Benz[a]anthracene	ND	µg/l	U	0.0166	0.00831
Basin P	4/3/2022	ISCO TWC	PAHs	Benz[a]anthracene	ND	µg/l	U	0.0185	0.00923
Basin P	4/29/2022	ISCO TWC	PAHs	Benz[a]anthracene	ND	µg/l	UJ	0.0158	0.00792
Basin Q	10/10/2020	ISCO TWC	PAHs	Benz[a]anthracene	ND	µg/l	U	0.0879	0.044
Basin Q	11/6/2020	ISCO TWC	PAHs	Benz[a]anthracene	0.0546	µg/l	J	0.0792	0.0396
Basin Q	11/6/2020	ISCO TWC-DUP	PAHs	Benz[a]anthracene	0.0559	µg/l	J	0.0842	0.0421
Basin Q	11/13/2020	ISCO TWC	PAHs	Benz[a]anthracene	ND	µg/l	U	0.0792	0.0396
Basin Q	12/11/2020	ISCO TWC	PAHs	Benz[a]anthracene	0.0312	µg/l	=	0.0215	0.0108
Basin R	11/16/2007	ISCO Composite	PAHs	Benz[a]anthracene	0.031	µg/l	=	-	-
Basin R	11/16/2007	ISCO Composite-DUP	PAHs	Benz[a]anthracene	ND	µg/l	U	-	0.0027
Basin L	12/26/2022	Grab, Post-SCM	PAHs	Benzo(a)pyrene	0.0284	µg/l	=	-	-
Basin L	1/13/2023	Grab, Post-SCM	PAHs	Benzo(a)pyrene	ND	µg/l	U	-	0.00962
Basin L	2/13/2023	Grab, Post-SCM	PAHs	Benzo(a)pyrene	0.0238	µg/l	=	-	-
Basin L	3/13/2023	Grab, Post-SCM	PAHs	Benzo(a)pyrene	ND	µg/l	U	-	0.00952
Basin M	10/23/2010	Grab	PAHs	Benzo(a)pyrene	0.15	µg/l	=	-	-
Basin M	11/6/2010	Grab	PAHs	Benzo(a)pyrene	0.41	µg/l	=	-	-
Basin M	2/12/2011	Grab	PAHs	Benzo(a)pyrene	0.61	µg/l	=	-	-
Basin M	11/11/2012	ISCO Composite	PAHs	Benzo(a)pyrene	0.12	µg/l	=	-	-
Basin M	2/22/2013	ISCO Composite	PAHs	Benzo(a)pyrene	0.26	µg/l	=	-	-
Basin M	3/8/2014	Grab	PAHs	Benzo(a)pyrene	0.39	µg/l	=	-	-
Basin M	3/9/2014	ISCO Composite	PAHs	Benzo(a)pyrene	0.79	µg/l	=	-	-
Basin M	4/13/2015	Composite Drum	PAHs	Benzo(a)pyrene	0.51	µg/l	=	0.02	0.0043
Basin M	12/3/2015	Composite Drum	PAHs	Benzo(a)pyrene	1	µg/l	=	0.019	0.00952
Basin M	12/17/2015	Composite Drum	PAHs	Benzo(a)pyrene	1.81	µg/l	=	0.019	0.00952
Basin M	1/25/2016	Composite Drum	PAHs	Benzo(a)pyrene	1.08	µg/l	=	0.019	0.00952
Basin M	2/27/2018	Pumped Composite	PAHs	Benzo(a)pyrene	0.3	µg/l	=	0.0189	0.00943
Basin M	3/14/2018	Pumped Composite	PAHs	Benzo(a)pyrene	0.112	µg/l	=	0.019	0.00952
Basin M	3/26/2018	Pumped Composite	PAHs	Benzo(a)pyrene	0.146	µg/l	=	0.019	0.00952
Basin N	3/13/2022	ISCO TWC	PAHs	Benzo(a)pyrene	0.016	µg/l	J	0.0178	0.00892

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin N	4/4/2022	ISCO TWC	PAHs	Benzo(a)pyrene	0.0356	µg/l	=	0.0309	0.0155
Basin N	4/30/2022	ISCO TWC	PAHs	Benzo(a)pyrene	0.0156	µg/l	J	0.016	0.00799
Basin P	4/29/2022	ISCO TWC-DUP	PAHs	Benzo(a)pyrene	0.0082	µg/l	J	0.0164	0.0082
Basin P	3/12/2022	ISCO TWC	PAHs	Benzo(a)pyrene	ND	µg/l	U	0.0166	0.00831
Basin P	4/3/2022	ISCO TWC	PAHs	Benzo(a)pyrene	ND	µg/l	U	0.0185	0.00923
Basin P	4/29/2022	ISCO TWC	PAHs	Benzo(a)pyrene	ND	µg/l	UJ	0.0158	0.00792
Basin Q	10/10/2020	ISCO TWC	PAHs	Benzo(a)pyrene	ND	µg/l	U	0.132	0.0659
Basin Q	11/6/2020	ISCO TWC-DUP	PAHs	Benzo(a)pyrene	0.0863	µg/l	J	0.126	0.0632
Basin Q	11/6/2020	ISCO TWC	PAHs	Benzo(a)pyrene	0.0897	µg/l	J	0.119	0.0594
Basin Q	11/13/2020	ISCO TWC	PAHs	Benzo(a)pyrene	0.072	µg/l	J	0.119	0.0594
Basin Q	12/11/2020	ISCO TWC	PAHs	Benzo(a)pyrene	0.0564	µg/l	=	0.0323	0.0161
Basin R	11/16/2007	ISCO Composite-DUP	PAHs	Benzo(a)pyrene	ND	µg/l	U	-	0.0045
Basin R	11/16/2007	ISCO Composite	PAHs	Benzo(a)pyrene	0.033	µg/l	=	-	-
Basin L	12/26/2022	Grab, Post-SCM	PAHs	Benzo(b)fluoranthene	0.0613	µg/l	=	-	-
Basin L	1/13/2023	Grab, Post-SCM	PAHs	Benzo(b)fluoranthene	0.0202	µg/l	=	-	-
Basin L	2/13/2023	Grab, Post-SCM	PAHs	Benzo(b)fluoranthene	0.061	µg/l	=	-	-
Basin L	3/13/2023	Grab, Post-SCM	PAHs	Benzo(b)fluoranthene	0.0119	µg/l	=	-	-
Basin L	12/26/2022	Grab, Post-SCM	PAHs	Benzo(g,h,i)perylene	0.0299	µg/l	=	-	-
Basin L	1/13/2023	Grab, Post-SCM	PAHs	Benzo(g,h,i)perylene	0.0121	µg/l	J	-	-
Basin L	2/13/2023	Grab, Post-SCM	PAHs	Benzo(g,h,i)perylene	0.0247	µg/l	=	-	-
Basin L	3/13/2023	Grab, Post-SCM	PAHs	Benzo(g,h,i)perylene	0.0106	µg/l	J	-	-
Basin M	10/23/2010	Grab	PAHs	Benzo(g,h,i)perylene	0.26	µg/l	=	-	-
Basin M	11/6/2010	Grab	PAHs	Benzo(g,h,i)perylene	0.42	µg/l	=	-	-
Basin M	2/12/2011	Grab	PAHs	Benzo(g,h,i)perylene	0.45	µg/l	=	-	-
Basin M	11/11/2012	ISCO Composite	PAHs	Benzo(g,h,i)perylene	0.14	µg/l	=	-	-
Basin M	2/22/2013	ISCO Composite	PAHs	Benzo(g,h,i)perylene	0.26	µg/l	=	-	-
Basin M	3/8/2014	Grab	PAHs	Benzo(g,h,i)perylene	0.33	µg/l	=	-	-
Basin M	3/9/2014	ISCO Composite	PAHs	Benzo(g,h,i)perylene	0.57	µg/l	=	-	-
Basin M	4/13/2015	Composite Drum	PAHs	Benzo(g,h,i)perylene	0.57	µg/l	=	0.02	0.0029
Basin M	12/3/2015	Composite Drum	PAHs	Benzo(g,h,i)perylene	0.71	µg/l	=	0.338	0.169
Basin M	12/17/2015	Composite Drum	PAHs	Benzo(g,h,i)perylene	1.65	µg/l	=	0.338	0.169
Basin M	1/25/2016	Composite Drum	PAHs	Benzo(g,h,i)perylene	1.16	µg/l	=	0.338	0.169
Basin M	2/27/2018	Pumped Composite	PAHs	Benzo(g,h,i)perylene	0.313	µg/l	=	0.0189	0.00943

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin M	3/14/2018	Pumped Composite	PAHs	Benzo(g,h,i)perylene	0.153	µg/l	=	0.019	0.00952
Basin M	3/26/2018	Pumped Composite	PAHs	Benzo(g,h,i)perylene	0.155	µg/l	=	0.019	0.00952
Basin N	3/13/2022	ISCO TWC	PAHs	Benzo(g,h,i)perylene	ND	µg/l	U	0.0357	0.0178
Basin N	4/4/2022	ISCO TWC	PAHs	Benzo(g,h,i)perylene	0.0202	µg/l	J	0.0206	0.0103
Basin N	4/30/2022	ISCO TWC	PAHs	Benzo(g,h,i)perylene	ND	µg/l	U	0.0319	0.016
Basin P	4/29/2022	ISCO TWC-DUP	PAHs	Benzo(g,h,i)perylene	ND	µg/l	U	0.0328	0.0164
Basin P	3/12/2022	ISCO TWC	PAHs	Benzo(g,h,i)perylene	ND	µg/l	U	0.0333	0.0166
Basin P	4/3/2022	ISCO TWC	PAHs	Benzo(g,h,i)perylene	ND	µg/l	U	0.0369	0.0185
Basin P	4/29/2022	ISCO TWC	PAHs	Benzo(g,h,i)perylene	ND	µg/l	U	0.0317	0.0158
Basin Q	10/10/2020	ISCO TWC	PAHs	Benzo(g,h,i)perylene	ND	µg/l	U	0.0879	0.044
Basin Q	11/6/2020	ISCO TWC-DUP	PAHs	Benzo(g,h,i)perylene	ND	µg/l	U	0.0842	0.0421
Basin Q	11/6/2020	ISCO TWC	PAHs	Benzo(g,h,i)perylene	ND	µg/l	U	0.0792	0.0396
Basin Q	11/13/2020	ISCO TWC	PAHs	Benzo(g,h,i)perylene	ND	µg/l	U	0.0792	0.0396
Basin Q	12/11/2020	ISCO TWC	PAHs	Benzo(g,h,i)perylene	0.0408	µg/l	=	0.0215	0.0108
Basin R	11/16/2007	ISCO Composite-DUP	PAHs	Benzo(g,h,i)perylene	ND	µg/l	U	-	0.003
Basin R	11/16/2007	ISCO Composite	PAHs	Benzo(g,h,i)perylene	0.036	µg/l	=	-	-
Basin L	12/26/2022	Grab, Post-SCM	PAHs	Benzo(k)fluoranthene	0.0167	µg/l	J	-	-
Basin L	1/13/2023	Grab, Post-SCM	PAHs	Benzo(k)fluoranthene	ND	µg/l	U	-	0.00962
Basin L	2/13/2023	Grab, Post-SCM	PAHs	Benzo(k)fluoranthene	0.0178	µg/l	J	-	-
Basin L	3/13/2023	Grab, Post-SCM	PAHs	Benzo(k)fluoranthene	ND	µg/l	U	-	0.00952
Basin M	10/23/2010	Grab	PAHs	Benzo[b]fluoranthene	0.17	µg/l	=	-	-
Basin M	11/6/2010	Grab	PAHs	Benzo[b]fluoranthene	0.47	µg/l	=	-	-
Basin M	2/12/2011	Grab	PAHs	Benzo[b]fluoranthene	0.72	µg/l	=	-	-
Basin M	11/11/2012	ISCO Composite	PAHs	Benzo[b]fluoranthene	0.17	µg/l	=	-	-
Basin M	2/22/2013	ISCO Composite	PAHs	Benzo[b]fluoranthene	0.37	µg/l	=	-	-
Basin M	3/8/2014	Grab	PAHs	Benzo[b]fluoranthene	0.63	µg/l	=	-	-
Basin M	3/9/2014	ISCO Composite	PAHs	Benzo[b]fluoranthene	1.2	µg/l	=	-	-
Basin M	4/13/2015	Composite Drum	PAHs	Benzo[b]fluoranthene	0.73	µg/l	=	0.02	0.0041
Basin M	12/3/2015	Composite Drum	PAHs	Benzo[b]fluoranthene	1.58	µg/l	J	0.019	0.00952
Basin M	12/17/2015	Composite Drum	PAHs	Benzo[b]fluoranthene	2.62	µg/l	J	0.019	0.00952
Basin M	1/25/2016	Composite Drum	PAHs	Benzo[b]fluoranthene	1.52	µg/l	=	0.019	0.00952
Basin M	2/27/2018	Pumped Composite	PAHs	Benzo[b]fluoranthene	0.428	µg/l	J	0.0189	0.00943
Basin M	3/14/2018	Pumped Composite	PAHs	Benzo[b]fluoranthene	0.186	µg/l	=	0.019	0.00952

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin M	3/26/2018	Pumped Composite	PAHs	Benzo[b]fluoranthene	0.228	µg/l	J	0.019	0.00952
Basin N	3/13/2022	ISCO TWC	PAHs	Benzo[b]fluoranthene	0.0317	µg/l	=	0.0178	0.00892
Basin N	4/4/2022	ISCO TWC	PAHs	Benzo[b]fluoranthene	0.0376	µg/l	=	0.0309	0.0155
Basin N	4/30/2022	ISCO TWC	PAHs	Benzo[b]fluoranthene	0.0252	µg/l	=	0.016	0.00799
Basin P	4/29/2022	ISCO TWC-DUP	PAHs	Benzo[b]fluoranthene	0.0176	µg/l	J	0.0164	0.0082
Basin P	3/12/2022	ISCO TWC	PAHs	Benzo[b]fluoranthene	ND	µg/l	U	0.0166	0.00831
Basin P	4/3/2022	ISCO TWC	PAHs	Benzo[b]fluoranthene	ND	µg/l	U	0.0185	0.00923
Basin P	4/29/2022	ISCO TWC	PAHs	Benzo[b]fluoranthene	0.0115	µg/l	J	0.0158	0.00792
Basin Q	10/10/2020	ISCO TWC	PAHs	Benzo[b]fluoranthene	ND	µg/l	U	0.132	0.0659
Basin Q	11/6/2020	ISCO TWC	PAHs	Benzo[b]fluoranthene	0.117	µg/l	J	0.119	0.0594
Basin Q	11/6/2020	ISCO TWC-DUP	PAHs	Benzo[b]fluoranthene	0.109	µg/l	J	0.126	0.0632
Basin Q	11/13/2020	ISCO TWC	PAHs	Benzo[b]fluoranthene	0.0878	µg/l	J	0.119	0.0594
Basin Q	12/11/2020	ISCO TWC	PAHs	Benzo[b]fluoranthene	0.0877	µg/l	J	0.0323	0.0161
Basin R	11/16/2007	ISCO Composite	PAHs	Benzo[b]fluoranthene	0.061	µg/l	J	-	-
Basin R	11/16/2007	ISCO Composite-DUP	PAHs	Benzo[b]fluoranthene	0.031	µg/l	J	-	-
Basin M	10/23/2010	Grab	PAHs	Benzo[k]fluoranthene	0.13	µg/l	=	-	-
Basin M	11/6/2010	Grab	PAHs	Benzo[k]fluoranthene	0.28	µg/l	=	-	-
Basin M	2/12/2011	Grab	PAHs	Benzo[k]fluoranthene	0.58	µg/l	=	-	-
Basin M	11/11/2012	ISCO Composite	PAHs	Benzo[k]fluoranthene	0.052	µg/l	=	-	-
Basin M	2/22/2013	ISCO Composite	PAHs	Benzo[k]fluoranthene	0.12	µg/l	=	-	-
Basin M	3/8/2014	Grab	PAHs	Benzo[k]fluoranthene	0.2	µg/l	=	-	-
Basin M	3/9/2014	ISCO Composite	PAHs	Benzo[k]fluoranthene	0.41	µg/l	=	-	-
Basin M	4/13/2015	Composite Drum	PAHs	Benzo[k]fluoranthene	0.12	µg/l	=	0.02	0.003
Basin M	12/3/2015	Composite Drum	PAHs	Benzo[k]fluoranthene	0.38	µg/l	J	0.019	0.00952
Basin M	12/17/2015	Composite Drum	PAHs	Benzo[k]fluoranthene	0.762	µg/l	J	0.019	0.00952
Basin M	1/25/2016	Composite Drum	PAHs	Benzo[k]fluoranthene	0.477	µg/l	J	0.019	0.00952
Basin M	2/27/2018	Pumped Composite	PAHs	Benzo[k]fluoranthene	0.118	µg/l	J	0.0189	0.00943
Basin M	3/14/2018	Pumped Composite	PAHs	Benzo[k]fluoranthene	0.0491	µg/l	=	0.019	0.00952
Basin M	3/26/2018	Pumped Composite	PAHs	Benzo[k]fluoranthene	0.0663	µg/l	J	0.019	0.00952
Basin N	3/13/2022	ISCO TWC	PAHs	Benzo[k]fluoranthene	ND	µg/l	U	0.0178	0.00892
Basin N	4/4/2022	ISCO TWC	PAHs	Benzo[k]fluoranthene	0.0183	µg/l	J	0.0309	0.0155
Basin N	4/30/2022	ISCO TWC	PAHs	Benzo[k]fluoranthene	0.00918	µg/l	J	0.016	0.00799
Basin P	4/29/2022	ISCO TWC-DUP	PAHs	Benzo[k]fluoranthene	ND	µg/l	U	0.0164	0.0082

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin P	3/12/2022	ISCO TWC	PAHs	Benzo[k]fluoranthene	ND	µg/l	U	0.0166	0.00831
Basin P	4/3/2022	ISCO TWC	PAHs	Benzo[k]fluoranthene	ND	µg/l	U	0.0185	0.00923
Basin P	4/29/2022	ISCO TWC	PAHs	Benzo[k]fluoranthene	ND	µg/l	U	0.0158	0.00792
Basin Q	10/10/2020	ISCO TWC	PAHs	Benzo[k]fluoranthene	ND	µg/l	U	0.132	0.0659
Basin Q	11/6/2020	ISCO TWC	PAHs	Benzo[k]fluoranthene	0.064	µg/l	J	0.119	0.0594
Basin Q	11/6/2020	ISCO TWC-DUP	PAHs	Benzo[k]fluoranthene	0.0638	µg/l	J	0.126	0.0632
Basin Q	11/13/2020	ISCO TWC	PAHs	Benzo[k]fluoranthene	ND	µg/l	U	0.119	0.0594
Basin Q	12/11/2020	ISCO TWC	PAHs	Benzo[k]fluoranthene	0.0323	µg/l	J	0.0323	0.0161
Basin R	11/16/2007	ISCO Composite	PAHs	Benzo[k]fluoranthene	0.025	µg/l	=	-	-
Basin R	11/16/2007	ISCO Composite-DUP	PAHs	Benzo[k]fluoranthene	ND	µg/l	U	-	0.0026
Basin M	10/23/2010		Phthalates	Benzyl butyl phthalate	ND	µg/l	U	-	0.43
Basin M	11/6/2010		Phthalates	Benzyl butyl phthalate	ND	µg/l	U	-	0.44
Basin M	2/12/2011		Phthalates	Benzyl butyl phthalate	ND	µg/l	U	-	0.5
Basin R	11/16/2007		Phthalates	Benzyl butyl phthalate	ND	µg/l	U	-	0.013
Basin M	10/23/2010	Grab	Metals	Cadmium	0.2	µg/l	=	-	-
Basin M	11/6/2010	Grab	Metals	Cadmium	0.24	µg/l	=	-	-
Basin M	2/12/2011	Grab	Metals	Cadmium	0.3	µg/l	=	-	-
Basin M	11/11/2012	ISCO Composite	Metals	Cadmium	0.082	µg/l	=	-	-
Basin M	2/22/2013	ISCO Composite	Metals	Cadmium	0.27	µg/l	=	-	-
Basin R	11/16/2007	ISCO Composite-DUP	Metals	Cadmium	0.416	µg/l	=	-	-
Basin R	11/16/2007	ISCO Composite	Metals	Cadmium	0.537	µg/l	=	-	-
Basin M	10/23/2010	Grab	Metals	Chromium	ND	µg/l	U	-	0.24
Basin M	11/6/2010	Grab	Metals	Chromium	4.1	µg/l	=	-	-
Basin M	2/12/2011	Grab	Metals	Chromium	6.4	µg/l	=	-	-
Basin M	11/11/2012	ISCO Composite	Metals	Chromium	1.72	µg/l	=	-	-
Basin M	2/22/2013	ISCO Composite	Metals	Chromium	3.29	µg/l	=	-	-
Basin R	11/16/2007	ISCO Composite-DUP	Metals	Chromium	0.88	µg/l	J	-	-
Basin R	11/16/2007	ISCO Composite	Metals	Chromium	1.86	µg/l	J	-	-
Basin L	12/26/2022	Grab, Post-SCM	PAHs	Chrysene	0.0494	µg/l	=	-	-
Basin L	1/13/2023	Grab, Post-SCM	PAHs	Chrysene	0.0165	µg/l	J	-	-
Basin L	2/13/2023	Grab, Post-SCM	PAHs	Chrysene	0.0454	µg/l	=	-	-
Basin L	3/13/2023	Grab, Post-SCM	PAHs	Chrysene	0.0152	µg/l	J	-	-
Basin M	10/23/2010	Grab	PAHs	Chrysene	0.11	µg/l	=	-	-

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin M	11/6/2010	Grab	PAHs	Chrysene	0.26	µg/l	=	-	-
Basin M	2/12/2011	Grab	PAHs	Chrysene	0.63	µg/l	=	-	-
Basin M	11/11/2012	ISCO Composite	PAHs	Chrysene	0.074	µg/l	=	-	-
Basin M	2/22/2013	ISCO Composite	PAHs	Chrysene	0.24	µg/l	=	-	-
Basin M	3/8/2014	Grab	PAHs	Chrysene	0.38	µg/l	=	-	-
Basin M	3/9/2014	ISCO Composite	PAHs	Chrysene	1.3	µg/l	=	-	-
Basin M	4/13/2015	Composite Drum	PAHs	Chrysene	0.27	µg/l	=	0.02	0.0034
Basin M	12/3/2015	Composite Drum	PAHs	Chrysene	0.93	µg/l	J	0.019	0.00952
Basin M	12/17/2015	Composite Drum	PAHs	Chrysene	2.2	µg/l	J	0.019	0.00952
Basin M	1/25/2016	Composite Drum	PAHs	Chrysene	0.946	µg/l	J	0.019	0.00952
Basin M	2/27/2018	Pumped Composite	PAHs	Chrysene	0.255	µg/l	J	0.0189	0.00943
Basin M	3/14/2018	Pumped Composite	PAHs	Chrysene	0.0847	µg/l	=	0.0198	0.0099
Basin M	3/26/2018	Pumped Composite	PAHs	Chrysene	0.126	µg/l	J	0.0198	0.0099
Basin N	3/13/2022	ISCO TWC	PAHs	Chrysene	0.0169	µg/l	J	0.0178	0.00892
Basin N	4/4/2022	ISCO TWC	PAHs	Chrysene	0.0201	µg/l	J	0.0206	0.0103
Basin N	4/30/2022	ISCO TWC	PAHs	Chrysene	0.0152	µg/l	J	0.016	0.00799
Basin P	4/29/2022	ISCO TWC-DUP	PAHs	Chrysene	0.00943	µg/l	J	0.0164	0.0082
Basin P	3/12/2022	ISCO TWC	PAHs	Chrysene	ND	µg/l	U	0.0166	0.00831
Basin P	4/3/2022	ISCO TWC	PAHs	Chrysene	ND	µg/l	U	0.0185	0.00923
Basin P	4/29/2022	ISCO TWC	PAHs	Chrysene	ND	µg/l	UJ	0.0158	0.00792
Basin Q	10/10/2020	ISCO TWC	PAHs	Chrysene	ND	µg/l	U	0.0879	0.044
Basin Q	11/6/2020	ISCO TWC-DUP	PAHs	Chrysene	ND	µg/l	U	0.0842	0.0421
Basin Q	11/6/2020	ISCO TWC	PAHs	Chrysene	0.051	µg/l	J	0.0792	0.0396
Basin Q	11/13/2020	ISCO TWC	PAHs	Chrysene	ND	µg/l	U	0.0792	0.0396
Basin Q	12/11/2020	ISCO TWC	PAHs	Chrysene	0.0484	µg/l	=	0.0215	0.0108
Basin R	11/16/2007	ISCO Composite-DUP	PAHs	Chrysene	0.029	µg/l	J	-	-
Basin R	11/16/2007	ISCO Composite	PAHs	Chrysene	0.049	µg/l	J	-	-
Basin L	12/26/2022	Grab, Post-SCM	Metals	Copper	3.53	µg/l	=	-	-
Basin L	1/13/2023	Grab, Post-SCM	Metals	Copper	2.82	µg/l	=	-	-
Basin L	2/13/2023	Grab, Post-SCM	Metals	Copper	ND	µg/l	U	90	-
Basin L	3/13/2023	Grab, Post-SCM	Metals	Copper	2.26	µg/l	=	-	0.019
Basin M	10/23/2010	Grab	Metals	Copper	25.6	µg/l	=	-	-
Basin M	11/6/2010	Grab	Metals	Copper	20.7	µg/l	=	-	-

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin M	2/12/2011	Grab	Metals	Copper	20.5	µg/l	=	-	-
Basin M	11/11/2012	ISCO Composite	Metals	Copper	7.75	µg/l	=	-	-
Basin M	2/22/2013	ISCO Composite	Metals	Copper	15.7	µg/l	=	-	-
Basin M	2/27/2018	Pumped Composite	Metals	Copper	14.2	µg/l	=	1	0.5
Basin M	3/14/2018	Pumped Composite	Metals	Copper	17.8	µg/l	=	1	0.5
Basin M	3/26/2018	Pumped Composite	Metals	Copper	11	µg/l	=	1	0.5
Basin R	11/16/2007	ISCO Composite	Metals	Copper	11.5	µg/l	=	-	-
Basin R	11/16/2007	ISCO Composite-DUP	Metals	Copper	8.94	µg/l	=	-	-
Basin M	10/23/2010	Grab	PAHs	cPAH/BaPeq	0.278	µg/l	=	-	-
Basin M	11/6/2010	Grab	PAHs	cPAH/BaPeq	0.63	µg/l	=	-	-
Basin M	2/12/2011	Grab	PAHs	cPAH/BaPeq	0.924	µg/l	=	-	-
Basin M	11/11/2012	ISCO Composite	PAHs	cPAH/BaPeq	0.192	µg/l	=	-	-
Basin M	2/22/2013	ISCO Composite	PAHs	cPAH/BaPeq	0.41	µg/l	=	-	-
Basin M	3/8/2014	Grab	PAHs	cPAH/BaPeq	0.608	µg/l	=	-	-
Basin M	3/9/2014	ISCO Composite	PAHs	cPAH/BaPeq	1.2	µg/l	=	-	-
Basin M	4/13/2015	Composite Drum	PAHs	cPAH/BaPeq	0.775	µg/l	=	0.02	0.0043
Basin M	12/3/2015	Composite Drum	PAHs	cPAH/BaPeq	1.43	µg/l	=	0.338	0.169
Basin M	12/17/2015	Composite Drum	PAHs	cPAH/BaPeq	2.64	µg/l	=	0.338	0.169
Basin M	1/25/2016	Composite Drum	PAHs	cPAH/BaPeq	1.62	µg/l	=	0.338	0.169
Basin M	2/27/2018	Pumped Composite	PAHs	cPAH/BaPeq	0.438	µg/l	=	0.0189	0.00943
Basin M	3/14/2018	Pumped Composite	PAHs	cPAH/BaPeq	0.176	µg/l	=	0.0198	0.0099
Basin M	3/26/2018	Pumped Composite	PAHs	cPAH/BaPeq	0.218	µg/l	=	0.0198	0.0099
Basin N	3/13/2022	ISCO TWC	PAHs	cPAH/BaPeq	0.023	µg/l	=	0.0357	0.0178
Basin N	4/4/2022	ISCO TWC	PAHs	cPAH/BaPeq	0.043	µg/l	=	0.0309	0.0155
Basin N	4/30/2022	ISCO TWC	PAHs	cPAH/BaPeq	0.021	µg/l	=	0.0319	0.016
Basin P	3/12/2022	ISCO TWC	PAHs	cPAH/BaPeq	ND	µg/l	U	0.0333	0.0166
Basin P	4/3/2022	ISCO TWC	PAHs	cPAH/BaPeq	ND	µg/l	U	0.0369	0.0185
Basin P	4/29/2022	ISCO TWC	PAHs	cPAH/BaPeq	0.001	µg/l	=	0.0317	0.0158
Basin P	4/29/2022	ISCO TWC-DUP	PAHs	cPAH/BaPeq	0.011	µg/l	=	0.0328	0.0164
Basin Q	10/10/2020	ISCO TWC	PAHs	cPAH/BaPeq	ND	µg/l	U	0.132	0.0659
Basin Q	10/10/2020	ISCO TWC	PAHs	cPAH/BaPeq	ND	µg/l	U	-	-
Basin Q	11/6/2020	ISCO TWC	PAHs	cPAH/BaPeq	0.112	µg/l	=	0.119	0.0594
Basin Q	11/6/2020	ISCO TWC-DUP	PAHs	cPAH/BaPeq	0.103428	µg/l	=	-	-

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin Q	11/6/2020	ISCO TWC-DUP	PAHs	cPAH/BaPeq	0.103	µg/l	=	0.126	0.0632
Basin Q	11/6/2020	ISCO TWC	PAHs	cPAH/BaPeq	0.111931	µg/l	=	-	-
Basin Q	11/13/2020	ISCO TWC	PAHs	cPAH/BaPeq	0.08078	µg/l	=	-	-
Basin Q	11/13/2020	ISCO TWC	PAHs	cPAH/BaPeq	0.0808	µg/l	=	0.119	0.0594
Basin Q	12/11/2020	ISCO TWC	PAHs	cPAH/BaPeq	0.0728	µg/l	=	0.0323	0.0161
Basin Q	12/11/2020	ISCO TWC	PAHs	cPAH/BaPeq	0.0728394	µg/l	=	-	-
Basin R	11/16/2007	ISCO Composite	PAHs	cPAH/BaPeq	0.0462	µg/l	=	-	0.0026
Basin R	11/16/2007	ISCO Composite-DUP	PAHs	cPAH/BaPeq	0.00313	µg/l	=	-	0.0045
Basin N	3/13/2022	ISCO TWC	Dioxins/Furans	D/F TEQ (2,3,7,8-TCDD eq)	0.303	pg/l	=	-	7.26
Basin N	4/4/2022	ISCO TWC	Dioxins/Furans	D/F TEQ (2,3,7,8-TCDD eq)	0.0552	pg/l	=	-	12.1
Basin N	4/29/2022	ISCO TWC	Dioxins/Furans	D/F TEQ (2,3,7,8-TCDD eq)	0.296	pg/l	=	-	6.33
Basin P	3/12/2022	ISCO TWC	Dioxins/Furans	D/F TEQ (2,3,7,8-TCDD eq)	0.00834	pg/l	=	-	7.84
Basin P	4/3/2022	ISCO TWC	Dioxins/Furans	D/F TEQ (2,3,7,8-TCDD eq)	0.0606	pg/l	=	-	12.5
Basin P	4/29/2022	ISCO TWC	Dioxins/Furans	D/F TEQ (2,3,7,8-TCDD eq)	0.336	pg/l	=	-	6.39
Basin P	4/29/2022	ISCO TWC-DUP	Dioxins/Furans	D/F TEQ (2,3,7,8-TCDD eq)	0.3	pg/l	=	-	8.15
Basin Q	10/10/2020	ISCO TWC	Dioxins/Furans	D/F TEQ (2,3,7,8-TCDD eq)	2.19	pg/l	=	91.8	3.67
Basin Q	11/6/2020	ISCO TWC	Dioxins/Furans	D/F TEQ (2,3,7,8-TCDD eq)	2.08	pg/l	=	101	31.2
Basin Q	11/6/2020	ISCO TWC-DUP	Dioxins/Furans	D/F TEQ (2,3,7,8-TCDD eq)	2.15	pg/l	=	100	25
Basin Q	11/13/2020	ISCO TWC	Dioxins/Furans	D/F TEQ (2,3,7,8-TCDD eq)	0.894	pg/l	=	109	5.14
Basin Q	12/11/2020	ISCO TWC	Dioxins/Furans	D/F TEQ (2,3,7,8-TCDD eq)	2.22	pg/l	=	108	14.6
Basin L	12/26/2022	Grab, Post-SCM	PAHs	Dibenz(a,h)anthracene	ND	µg/l	U	-	0.00971
Basin L	1/13/2023	Grab, Post-SCM	PAHs	Dibenz(a,h)anthracene	ND	µg/l	U	-	0.00962
Basin L	2/13/2023	Grab, Post-SCM	PAHs	Dibenz(a,h)anthracene	ND	µg/l	U	-	0.01
Basin L	3/13/2023	Grab, Post-SCM	PAHs	Dibenz(a,h)anthracene	ND	µg/l	U	-	0.00952
Basin M	10/23/2010	Grab	PAHs	Dibenz[a,h]anthracene	0.085	µg/l	=	-	-
Basin M	11/6/2010	Grab	PAHs	Dibenz[a,h]anthracene	0.13	µg/l	=	-	-
Basin M	2/12/2011	Grab	PAHs	Dibenz[a,h]anthracene	0.15	µg/l	=	-	-
Basin M	11/11/2012	ISCO Composite	PAHs	Dibenz[a,h]anthracene	0.033	µg/l	=	-	-
Basin M	2/22/2013	ISCO Composite	PAHs	Dibenz[a,h]anthracene	0.064	µg/l	=	-	-
Basin M	3/8/2014	Grab	PAHs	Dibenz[a,h]anthracene	0.085	µg/l	=	-	-
Basin M	3/9/2014	ISCO Composite	PAHs	Dibenz[a,h]anthracene	0.15	µg/l	=	-	-
Basin M	4/13/2015	Composite Drum	PAHs	Dibenz[a,h]anthracene	0.13	µg/l	=	0.02	0.0025
Basin M	12/3/2015	Composite Drum	PAHs	Dibenz[a,h]anthracene	0.156	µg/l	=	0.169	0.0845

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin M	12/17/2015	Composite Drum	PAHs	Dibenz[a,h]anthracene	0.289	µg/l	=	0.169	0.0845
Basin M	1/25/2016	Composite Drum	PAHs	Dibenz[a,h]anthracene	0.254	µg/l	=	0.169	0.0845
Basin M	2/27/2018	Pumped Composite	PAHs	Dibenz[a,h]anthracene	0.052	µg/l	=	0.0189	0.00943
Basin M	3/14/2018	Pumped Composite	PAHs	Dibenz[a,h]anthracene	0.0251	µg/l	=	0.019	0.00952
Basin M	3/26/2018	Pumped Composite	PAHs	Dibenz[a,h]anthracene	0.0267	µg/l	=	0.019	0.00952
Basin N	3/13/2022	ISCO TWC	PAHs	Dibenz[a,h]anthracene	ND	µg/l	U	0.0178	0.00892
Basin N	4/4/2022	ISCO TWC	PAHs	Dibenz[a,h]anthracene	ND	µg/l	U	0.0206	0.0103
Basin N	4/30/2022	ISCO TWC	PAHs	Dibenz[a,h]anthracene	ND	µg/l	U	0.016	0.00799
Basin P	4/29/2022	ISCO TWC-DUP	PAHs	Dibenz[a,h]anthracene	ND	µg/l	U	0.0164	0.0082
Basin P	3/12/2022	ISCO TWC	PAHs	Dibenz[a,h]anthracene	ND	µg/l	U	0.0166	0.00831
Basin P	4/3/2022	ISCO TWC	PAHs	Dibenz[a,h]anthracene	ND	µg/l	U	0.0185	0.00923
Basin P	4/29/2022	ISCO TWC	PAHs	Dibenz[a,h]anthracene	ND	µg/l	U	0.0158	0.00792
Basin Q	10/10/2020	ISCO TWC	PAHs	Dibenz[a,h]anthracene	ND	µg/l	U	0.0879	0.044
Basin Q	11/6/2020	ISCO TWC	PAHs	Dibenz[a,h]anthracene	ND	µg/l	U	0.0792	0.0396
Basin Q	11/6/2020	ISCO TWC-DUP	PAHs	Dibenz[a,h]anthracene	ND	µg/l	U	0.0842	0.0421
Basin Q	11/13/2020	ISCO TWC	PAHs	Dibenz[a,h]anthracene	ND	µg/l	U	0.0792	0.0396
Basin Q	12/11/2020	ISCO TWC	PAHs	Dibenz[a,h]anthracene	ND	µg/l	U	0.0215	0.0108
Basin R	11/16/2007	ISCO Composite	PAHs	Dibenz[a,h]anthracene	ND	µg/l	U	-	0.0026
Basin R	11/16/2007	ISCO Composite-DUP	PAHs	Dibenz[a,h]anthracene	ND	µg/l	U	-	0.0026
Basin M	11/11/2012	ISCO Composite	PAHs	Dibenzofuran	0.0064	µg/l	J	-	-
Basin M	2/22/2013	ISCO Composite	PAHs	Dibenzofuran	0.008	µg/l	=	-	-
Basin M	4/13/2015	Composite Drum	PAHs	Dibenzofuran	ND	µg/l	U	0.02	0.0093
Basin M	12/3/2015	Composite Drum	PAHs	Dibenzofuran	0.0222	µg/l	=	0.338	0.169
Basin M	12/17/2015	Composite Drum	PAHs	Dibenzofuran	ND	µg/l	U	0.338	0.156
Basin M	1/25/2016	Composite Drum	PAHs	Dibenzofuran	ND	µg/l	U	0.338	0.169
Basin M	2/27/2018	Pumped Composite	PAHs	Dibenzofuran	0.0149	µg/l	J	0.0189	0.00943
Basin M	3/14/2018	Pumped Composite	PAHs	Dibenzofuran	ND	µg/l	U	0.019	0.0099
Basin M	3/26/2018	Pumped Composite	PAHs	Dibenzofuran	ND	µg/l	U	0.019	0.00952
Basin M	10/23/2010		Phthalates	Dibutyl phthalate	ND	µg/l	U	-	0.45
Basin M	11/6/2010		Phthalates	Dibutyl phthalate	ND	µg/l	U	-	0.45
Basin M	2/12/2011		Phthalates	Dibutyl phthalate	ND	µg/l	U	-	0.5
Basin R	11/16/2007		Phthalates	Dibutyl phthalate	0.24	µg/l	J	-	-
Basin M	10/23/2010		Phthalates	Diethyl phthalate	ND	µg/l	U	-	0.41

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin M	11/6/2010		Phthalates	Diethyl phthalate	ND	µg/l	U	-	0.41
Basin M	2/12/2011		Phthalates	Diethyl phthalate	ND	µg/l	U	-	0.47
Basin R	11/16/2007		Phthalates	Diethyl phthalate	0.11	µg/l	J	-	-
Basin M	10/23/2010		Phthalates	Dimethyl phthalate	ND	µg/l	U	-	0.26
Basin M	11/6/2010		Phthalates	Dimethyl phthalate	ND	µg/l	U	-	0.27
Basin M	2/12/2011		Phthalates	Dimethyl phthalate	ND	µg/l	U	-	0.3
Basin R	11/16/2007		Phthalates	Dimethyl phthalate	0.2	µg/l	J	-	-
Basin M	10/23/2010		Phthalates	Di-n-octyl phthalate	5.2	µg/l	=	-	-
Basin M	11/6/2010		Phthalates	Di-n-octyl phthalate	ND	µg/l	U	-	0.48
Basin M	2/12/2011		Phthalates	Di-n-octyl phthalate	ND	µg/l	U	-	0.54
Basin R	11/16/2007		Phthalates	Di-n-octyl phthalate	0.045	µg/l	J	-	-
Basin L	12/26/2022	Grab, Post-SCM	PAHs	Fluoranthene	0.0507	µg/l	=	-	-
Basin L	1/13/2023	Grab, Post-SCM	PAHs	Fluoranthene	0.0179	µg/l	J	-	-
Basin L	2/13/2023	Grab, Post-SCM	PAHs	Fluoranthene	0.0483	µg/l	=	-	-
Basin L	3/13/2023	Grab, Post-SCM	PAHs	Fluoranthene	0.0159	µg/l	J	-	-
Basin M	10/23/2010	Grab	PAHs	Fluoranthene	0.096	µg/l	=	-	-
Basin M	11/6/2010	Grab	PAHs	Fluoranthene	0.14	µg/l	=	-	-
Basin M	2/12/2011	Grab	PAHs	Fluoranthene	0.8	µg/l	=	-	-
Basin M	11/11/2012	ISCO Composite	PAHs	Fluoranthene	0.092	µg/l	=	-	-
Basin M	2/22/2013	ISCO Composite	PAHs	Fluoranthene	0.22	µg/l	=	-	-
Basin M	3/8/2014	Grab	PAHs	Fluoranthene	0.47	µg/l	=	-	-
Basin M	3/9/2014	ISCO Composite	PAHs	Fluoranthene	1.1	µg/l	=	-	-
Basin M	4/13/2015	Composite Drum	PAHs	Fluoranthene	0.096	µg/l	=	0.02	0.01
Basin M	12/3/2015	Composite Drum	PAHs	Fluoranthene	0.511	µg/l	=	0.313	0.156
Basin M	12/17/2015	Composite Drum	PAHs	Fluoranthene	1.2	µg/l	=	0.313	0.156
Basin M	1/25/2016	Composite Drum	PAHs	Fluoranthene	0.435	µg/l	=	0.313	0.156
Basin M	2/27/2018	Pumped Composite	PAHs	Fluoranthene	0.275	µg/l	=	0.0189	0.00943
Basin M	3/14/2018	Pumped Composite	PAHs	Fluoranthene	0.0877	µg/l	=	0.019	0.00952
Basin M	3/26/2018	Pumped Composite	PAHs	Fluoranthene	0.143	µg/l	=	0.019	0.00952
Basin N	3/13/2022	ISCO TWC	PAHs	Fluoranthene	0.0312	µg/l	J	0.0357	0.0178
Basin N	4/4/2022	ISCO TWC	PAHs	Fluoranthene	0.0255	µg/l	=	0.0206	0.0103
Basin N	4/30/2022	ISCO TWC	PAHs	Fluoranthene	0.0252	µg/l	J	0.0319	0.016
Basin P	4/29/2022	ISCO TWC-DUP	PAHs	Fluoranthene	0.018	µg/l	J	0.0328	0.0164

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin P	3/12/2022	ISCO TWC	PAHs	Fluoranthene	ND	µg/l	U	0.0333	0.0166
Basin P	4/3/2022	ISCO TWC	PAHs	Fluoranthene	ND	µg/l	U	0.0369	0.0185
Basin P	4/29/2022	ISCO TWC	PAHs	Fluoranthene	0.0158	µg/l	J	0.0317	0.0158
Basin Q	10/10/2020	ISCO TWC	PAHs	Fluoranthene	ND	µg/l	U	0.0879	0.044
Basin Q	11/6/2020	ISCO TWC-DUP	PAHs	Fluoranthene	0.0428	µg/l	J	0.0842	0.0421
Basin Q	11/6/2020	ISCO TWC	PAHs	Fluoranthene	0.0444	µg/l	J	0.0792	0.0396
Basin Q	11/13/2020	ISCO TWC	PAHs	Fluoranthene	0.0487	µg/l	J	0.0792	0.0396
Basin Q	12/11/2020	ISCO TWC	PAHs	Fluoranthene	0.0557	µg/l	=	0.0215	0.0108
Basin R	11/16/2007	ISCO Composite	PAHs	Fluoranthene	0.096	µg/l	J	-	-
Basin R	11/16/2007	ISCO Composite-DUP	PAHs	Fluoranthene	0.063	µg/l	J	-	-
Basin L	12/26/2022	Grab, Post-SCM	PAHs	Fluorene	ND	µg/l	U	-	0.00971
Basin L	1/13/2023	Grab, Post-SCM	PAHs	Fluorene	ND	µg/l	U	-	0.00962
Basin L	2/13/2023	Grab, Post-SCM	PAHs	Fluorene	ND	µg/l	UJ	-	0.01
Basin L	3/13/2023	Grab, Post-SCM	PAHs	Fluorene	ND	µg/l	U	-	0.00952
Basin M	10/23/2010	Grab	PAHs	Fluorene	0.011	µg/l	J	-	-
Basin M	11/6/2010	Grab	PAHs	Fluorene	0.008	µg/l	J	-	-
Basin M	2/12/2011	Grab	PAHs	Fluorene	0.077	µg/l	=	-	-
Basin M	11/11/2012	ISCO Composite	PAHs	Fluorene	0.0089	µg/l	=	-	-
Basin M	2/22/2013	ISCO Composite	PAHs	Fluorene	0.014	µg/l	=	-	-
Basin M	3/8/2014	Grab	PAHs	Fluorene	0.04	µg/l	=	-	-
Basin M	3/9/2014	ISCO Composite	PAHs	Fluorene	0.098	µg/l	=	-	-
Basin M	4/13/2015	Composite Drum	PAHs	Fluorene	0.026	µg/l	=	0.02	0.0038
Basin M	12/3/2015	Composite Drum	PAHs	Fluorene	0.0384	µg/l	=	0.338	0.169
Basin M	12/17/2015	Composite Drum	PAHs	Fluorene	ND	µg/l	U	0.338	0.156
Basin M	1/25/2016	Composite Drum	PAHs	Fluorene	ND	µg/l	U	0.338	0.169
Basin M	2/27/2018	Pumped Composite	PAHs	Fluorene	0.022	µg/l	=	0.0189	0.00943
Basin M	3/14/2018	Pumped Composite	PAHs	Fluorene	ND	µg/l	U	0.019	0.0099
Basin M	3/26/2018	Pumped Composite	PAHs	Fluorene	0.0142	µg/l	J	0.019	0.00952
Basin N	3/13/2022	ISCO TWC	PAHs	Fluorene	ND	µg/l	U	0.0357	0.0178
Basin N	4/4/2022	ISCO TWC	PAHs	Fluorene	ND	µg/l	U	0.0206	0.0103
Basin N	4/30/2022	ISCO TWC	PAHs	Fluorene	ND	µg/l	U	0.0319	0.016
Basin P	4/29/2022	ISCO TWC-DUP	PAHs	Fluorene	ND	µg/l	UJ	0.205	0.205
Basin P	3/12/2022	ISCO TWC	PAHs	Fluorene	0.0224	µg/l	J	0.0333	0.0166

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin P	4/3/2022	ISCO TWC	PAHs	Fluorene	0.0226	µg/l	J	0.0369	0.0185
Basin P	4/29/2022	ISCO TWC	PAHs	Fluorene	ND	µg/l	U	0.0317	0.0317
Basin Q	10/10/2020	ISCO TWC	PAHs	Fluorene	ND	µg/l	U	0.0879	0.044
Basin Q	11/6/2020	ISCO TWC-DUP	PAHs	Fluorene	ND	µg/l	U	0.0842	0.0421
Basin Q	11/6/2020	ISCO TWC	PAHs	Fluorene	ND	µg/l	U	0.0792	0.0396
Basin Q	11/13/2020	ISCO TWC	PAHs	Fluorene	ND	µg/l	U	0.0792	0.0396
Basin Q	12/11/2020	ISCO TWC	PAHs	Fluorene	ND	µg/l	U	0.0215	0.0108
Basin R	11/16/2007	ISCO Composite	PAHs	Fluorene	ND	µg/l	U	-	0.004
Basin R	11/16/2007	ISCO Composite-DUP	PAHs	Fluorene	ND	µg/l	U	-	0.004
Basin L	12/26/2022	Grab, Post-SCM	PAHs	Indeno(1,2,3-cd)pyrene	0.0305	µg/l	=	-	-
Basin L	1/13/2023	Grab, Post-SCM	PAHs	Indeno(1,2,3-cd)pyrene	0.0124	µg/l	J	-	-
Basin L	2/13/2023	Grab, Post-SCM	PAHs	Indeno(1,2,3-cd)pyrene	0.0268	µg/l	=	-	-
Basin L	3/13/2023	Grab, Post-SCM	PAHs	Indeno(1,2,3-cd)pyrene	0.0121	µg/l	J	-	-
Basin M	10/23/2010	Grab	PAHs	Indeno(1,2,3-cd)pyrene	0.16	µg/l	=	-	-
Basin M	11/6/2010	Grab	PAHs	Indeno(1,2,3-cd)pyrene	0.27	µg/l	=	-	-
Basin M	2/12/2011	Grab	PAHs	Indeno(1,2,3-cd)pyrene	0.36	µg/l	=	-	-
Basin M	11/11/2012	ISCO Composite	PAHs	Indeno(1,2,3-cd)pyrene	0.13	µg/l	=	-	-
Basin M	2/22/2013	ISCO Composite	PAHs	Indeno(1,2,3-cd)pyrene	0.3	µg/l	=	-	-
Basin M	3/8/2014	Grab	PAHs	Indeno(1,2,3-cd)pyrene	0.3	µg/l	=	-	-
Basin M	3/9/2014	ISCO Composite	PAHs	Indeno(1,2,3-cd)pyrene	0.51	µg/l	=	-	-
Basin M	4/13/2015	Composite Drum	PAHs	Indeno(1,2,3-cd)pyrene	0.41	µg/l	=	0.02	0.0026
Basin M	12/3/2015	Composite Drum	PAHs	Indeno(1,2,3-cd)pyrene	0.625	µg/l	=	0.019	0.00952
Basin M	12/17/2015	Composite Drum	PAHs	Indeno(1,2,3-cd)pyrene	1.31	µg/l	=	0.019	0.00952
Basin M	1/25/2016	Composite Drum	PAHs	Indeno(1,2,3-cd)pyrene	0.799	µg/l	=	0.019	0.00952
Basin M	2/27/2018	Pumped Composite	PAHs	Indeno(1,2,3-cd)pyrene	0.233	µg/l	=	0.0189	0.00943
Basin M	3/14/2018	Pumped Composite	PAHs	Indeno(1,2,3-cd)pyrene	0.119	µg/l	=	0.019	0.00952
Basin M	3/26/2018	Pumped Composite	PAHs	Indeno(1,2,3-cd)pyrene	0.122	µg/l	=	0.019	0.00952
Basin N	3/13/2022	ISCO TWC	PAHs	Indeno(1,2,3-cd)pyrene	0.0174	µg/l	J	0.0178	0.00892
Basin N	4/4/2022	ISCO TWC	PAHs	Indeno(1,2,3-cd)pyrene	0.0193	µg/l	J	0.0206	0.0103
Basin N	4/30/2022	ISCO TWC	PAHs	Indeno(1,2,3-cd)pyrene	0.0144	µg/l	J	0.016	0.00799
Basin P	4/29/2022	ISCO TWC-DUP	PAHs	Indeno(1,2,3-cd)pyrene	ND	µg/l	U	0.0164	0.0082
Basin P	3/12/2022	ISCO TWC	PAHs	Indeno(1,2,3-cd)pyrene	ND	µg/l	U	0.0166	0.00831
Basin P	4/3/2022	ISCO TWC	PAHs	Indeno(1,2,3-cd)pyrene	ND	µg/l	U	0.0185	0.00923

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin P	4/29/2022	ISCO TWC	PAHs	Indeno(1,2,3-cd)pyrene	ND	µg/l	U	0.0158	0.00792
Basin Q	10/10/2020	ISCO TWC	PAHs	Indeno(1,2,3-cd)pyrene	ND	µg/l	U	0.0879	0.044
Basin Q	11/6/2020	ISCO TWC	PAHs	Indeno(1,2,3-cd)pyrene	0.0438	µg/l	J	0.0792	0.0396
Basin Q	11/6/2020	ISCO TWC-DUP	PAHs	Indeno(1,2,3-cd)pyrene	ND	µg/l	U	0.0842	0.0421
Basin Q	11/13/2020	ISCO TWC	PAHs	Indeno(1,2,3-cd)pyrene	ND	µg/l	U	0.0792	0.0396
Basin Q	12/11/2020	ISCO TWC	PAHs	Indeno(1,2,3-cd)pyrene	0.0377	µg/l	=	0.0215	0.0108
Basin R	11/16/2007	ISCO Composite-DUP	PAHs	Indeno(1,2,3-cd)pyrene	ND	µg/l	U	-	0.0027
Basin R	11/16/2007	ISCO Composite	PAHs	Indeno(1,2,3-cd)pyrene	0.033	µg/l	=	-	-
Basin M	2/27/2018	Pumped Composite	Metals	Iron	4210	µg/l	=	50	25
Basin M	3/14/2018	Pumped Composite	Metals	Iron	4970	µg/l	=	50	25
Basin M	3/26/2018	Pumped Composite	Metals	Iron	2800	µg/l	=	50	25
Basin M	10/23/2010	Grab	Metals	Lead	32.3	µg/l	=	-	-
Basin M	11/6/2010	Grab	Metals	Lead	3.6	µg/l	=	-	-
Basin M	2/12/2011	Grab	Metals	Lead	25	µg/l	=	-	-
Basin M	11/11/2012	ISCO Composite	Metals	Lead	9	µg/l	=	-	-
Basin M	2/22/2013	ISCO Composite	Metals	Lead	32.8	µg/l	=	-	-
Basin M	2/27/2018	Pumped Composite	Metals	Lead	19	µg/l	=	0.2	0.1
Basin M	3/14/2018	Pumped Composite	Metals	Lead	30.2	µg/l	=	0.2	0.1
Basin M	3/26/2018	Pumped Composite	Metals	Lead	17.4	µg/l	=	0.2	0.1
Basin R	11/16/2007	ISCO Composite	Metals	Lead	13.8	µg/l	J	-	-
Basin R	11/16/2007	ISCO Composite-DUP	Metals	Lead	7.04	µg/l	J	-	-
Basin M	10/23/2010	Grab	Metals	Mercury	ND	µg/l	U	-	0.011
Basin M	11/6/2010	Grab	Metals	Mercury	ND	µg/l	U	-	0.011
Basin M	2/12/2011	Grab	Metals	Mercury	ND	µg/l	U	-	0.011
Basin M	11/11/2012	ISCO Composite	Metals	Mercury	ND	µg/l	U	-	0.02
Basin M	2/22/2013	ISCO Composite	Metals	Mercury	ND	µg/l	U	-	0.02
Basin N	3/13/2022	ISCO TWC	Metals	Mercury	ND	mg/l	U	0.0001	0.00005
Basin N	4/4/2022	ISCO TWC	Metals	Mercury	ND	mg/l	U	0.0001	0.00005
Basin N	4/30/2022	ISCO TWC	Metals	Mercury	ND	mg/l	U	0.00008	0.00004
Basin R	11/16/2007	ISCO Composite	Metals	Mercury	ND	µg/l	U	-	0.03
Basin L	12/26/2022	Grab, Post-SCM	PAHs	Naphthalene	ND	µg/l	U	-	0.0194
Basin L	1/13/2023	Grab, Post-SCM	PAHs	Naphthalene	0.0352	µg/l	J	-	-
Basin L	2/13/2023	Grab, Post-SCM	PAHs	Naphthalene	ND	µg/l	UJ	-	0.02

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin L	3/13/2023	Grab, Post-SCM	PAHs	Naphthalene	ND	µg/l	U	-	0.019
Basin M	10/23/2010	Grab	PAHs	Naphthalene	0.01	µg/l	J	-	-
Basin M	11/6/2010	Grab	PAHs	Naphthalene	0.016	µg/l	J	-	-
Basin M	2/12/2011	Grab	PAHs	Naphthalene	0.057	µg/l	J	-	-
Basin M	11/11/2012	ISCO Composite	PAHs	Naphthalene	0.031	µg/l	J	-	-
Basin M	2/22/2013	ISCO Composite	PAHs	Naphthalene	0.013	µg/l	=	-	-
Basin M	3/8/2014	Grab	PAHs	Naphthalene	0.015	µg/l	=	-	-
Basin M	3/9/2014	ISCO Composite	PAHs	Naphthalene	0.021	µg/l	=	-	-
Basin M	4/13/2015	Composite Drum	PAHs	Naphthalene	0.11	µg/l	=	0.02	0.0038
Basin M	12/3/2015	Composite Drum	PAHs	Naphthalene	0.0227	µg/l	=	0.676	0.338
Basin M	12/17/2015	Composite Drum	PAHs	Naphthalene	ND	µg/l	U	0.676	0.313
Basin M	1/25/2016	Composite Drum	PAHs	Naphthalene	ND	µg/l	U	0.676	0.338
Basin M	2/27/2018	Pumped Composite	PAHs	Naphthalene	0.0435	µg/l	=	0.0377	0.0189
Basin M	3/14/2018	Pumped Composite	PAHs	Naphthalene	0.219	µg/l	=	0.0396	0.0198
Basin M	3/26/2018	Pumped Composite	PAHs	Naphthalene	0.0281	µg/l	J	0.0396	0.0198
Basin N	3/13/2022	ISCO TWC	PAHs	Naphthalene	ND	µg/l	U	0.0713	0.0357
Basin N	4/4/2022	ISCO TWC	PAHs	Naphthalene	ND	µg/l	U	0.0412	0.0206
Basin N	4/30/2022	ISCO TWC	PAHs	Naphthalene	ND	µg/l	U	0.0639	0.0319
Basin P	4/29/2022	ISCO TWC-DUP	PAHs	Naphthalene	0.0414	µg/l	J	0.0656	0.0328
Basin P	3/12/2022	ISCO TWC	PAHs	Naphthalene	0.0461	µg/l	J	0.0665	0.0333
Basin P	4/3/2022	ISCO TWC	PAHs	Naphthalene	0.0595	µg/l	J	0.0738	0.0369
Basin P	4/29/2022	ISCO TWC	PAHs	Naphthalene	0.0459	µg/l	J	0.0634	0.0317
Basin Q	10/10/2020	ISCO TWC	PAHs	Naphthalene	ND	µg/l	U	0.176	0.0879
Basin Q	11/6/2020	ISCO TWC	PAHs	Naphthalene	ND	µg/l	U	0.158	0.0792
Basin Q	11/6/2020	ISCO TWC-DUP	PAHs	Naphthalene	ND	µg/l	U	0.168	0.0842
Basin Q	11/13/2020	ISCO TWC	PAHs	Naphthalene	ND	µg/l	U	0.158	0.0792
Basin Q	12/11/2020	ISCO TWC	PAHs	Naphthalene	ND	µg/l	U	0.043	0.0215
Basin R	11/16/2007	ISCO Composite-DUP	PAHs	Naphthalene	0.024	µg/l	=	-	-
Basin R	11/16/2007	ISCO Composite	PAHs	Naphthalene	0.027	µg/l	=	-	-
Basin M	10/23/2010	Grab	Metals	Nickel	4	µg/l	=	-	-
Basin M	11/6/2010	Grab	Metals	Nickel	3.9	µg/l	=	-	-
Basin M	2/12/2011	Grab	Metals	Nickel	4.5	µg/l	=	-	-
Basin M	11/11/2012	ISCO Composite	Metals	Nickel	1.04	µg/l	=	-	-

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin M	2/22/2013	ISCO Composite	Metals	Nickel	2.48	µg/l	=	-	-
Basin R	11/16/2007	ISCO Composite	Metals	Nickel	2.13	µg/l	=	-	-
Basin R	11/16/2007	ISCO Composite-DUP	Metals	Nickel	1.63	µg/l	=	-	-
Basin N	3/13/2022	ISCO TWC	Dioxins/Furans	OCDD	189	pg/l	=	-	-
Basin N	4/4/2022	ISCO TWC	Dioxins/Furans	OCDD	184	pg/l	=	-	-
Basin N	4/29/2022	ISCO TWC	Dioxins/Furans	OCDD	186	pg/l	=	-	-
Basin P	3/12/2022	ISCO TWC	Dioxins/Furans	OCDD	27.8	pg/l	J	-	-
Basin P	4/3/2022	ISCO TWC	Dioxins/Furans	OCDD	202	pg/l	=	-	-
Basin P	4/29/2022	ISCO TWC	Dioxins/Furans	OCDD	209	pg/l	J	-	-
Basin P	4/29/2022	ISCO TWC-DUP	Dioxins/Furans	OCDD	133	pg/l	J	-	-
Basin Q	10/10/2020	ISCO TWC	Dioxins/Furans	OCDD	603	pg/l	=	91.8	3.67
Basin Q	11/6/2020	ISCO TWC-DUP	Dioxins/Furans	OCDD	1780	pg/l	=	100	25
Basin Q	11/6/2020	ISCO TWC	Dioxins/Furans	OCDD	1840	pg/l	=	101	31.2
Basin Q	11/13/2020	ISCO TWC	Dioxins/Furans	OCDD	742	pg/l	=	109	5.14
Basin Q	12/11/2020	ISCO TWC	Dioxins/Furans	OCDD	1720	pg/l	=	108	9.47
Basin N	3/13/2022	ISCO TWC	Dioxins/Furans	OCDF	ND	pg/l	U	-	7.26
Basin N	4/4/2022	ISCO TWC	Dioxins/Furans	OCDF	ND	pg/l	U	-	5.37
Basin N	4/29/2022	ISCO TWC	Dioxins/Furans	OCDF	ND	pg/l	U	-	6.33
Basin P	3/12/2022	ISCO TWC	Dioxins/Furans	OCDF	ND	pg/l	U	-	6.13
Basin P	4/3/2022	ISCO TWC	Dioxins/Furans	OCDF	ND	pg/l	U	-	10.4
Basin P	4/29/2022	ISCO TWC	Dioxins/Furans	OCDF	35.1	pg/l	J	-	-
Basin P	4/29/2022	ISCO TWC-DUP	Dioxins/Furans	OCDF	ND	pg/l	UJ	-	7.32
Basin Q	10/10/2020	ISCO TWC	Dioxins/Furans	OCDF	7.44	pg/l	J	91.8	1.63
Basin Q	11/6/2020	ISCO TWC-DUP	Dioxins/Furans	OCDF	20.7	pg/l	J	100	11.4
Basin Q	11/6/2020	ISCO TWC	Dioxins/Furans	OCDF	21.1	pg/l	J	101	13.3
Basin Q	11/13/2020	ISCO TWC	Dioxins/Furans	OCDF	11.6	pg/l	J	109	3.33
Basin Q	12/11/2020	ISCO TWC	Dioxins/Furans	OCDF	22.3	pg/l	J	108	7.02
Basin M	10/23/2010		PCBs	PCBs, Total congeners	0.0276	µg/l	J	-	-
Basin M	11/6/2010		PCBs	PCBs, Total congeners	0.0174	µg/l	J	-	-
Basin M	2/12/2011		PCBs	PCBs, Total congeners	0.0331	µg/l	J	-	-
Basin Q	10/23/2010		PCBs	PCBs, Total congeners	0.0177	µg/l	J	-	-
Basin R	11/16/2007		PCBs	PCBs, Total congeners	0.0349	µg/l	J	-	-
Basin L	12/26/2022	Grab, Post-SCM	PAHs	Phenanthrene	0.0231	µg/l	=	-	-

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin L	1/13/2023	Grab, Post-SCM	PAHs	Phenanthrene	ND	µg/l	U	-	0.00962
Basin L	2/13/2023	Grab, Post-SCM	PAHs	Phenanthrene	0.0262	µg/l	=	-	-
Basin L	3/13/2023	Grab, Post-SCM	PAHs	Phenanthrene	ND	µg/l	U	-	0.00952
Basin M	10/23/2010	Grab	PAHs	Phenanthrene	0.031	µg/l	=	-	-
Basin M	11/6/2010	Grab	PAHs	Phenanthrene	0.049	µg/l	=	-	-
Basin M	2/12/2011	Grab	PAHs	Phenanthrene	0.27	µg/l	=	-	-
Basin M	11/11/2012	ISCO Composite	PAHs	Phenanthrene	0.033	µg/l	=	-	-
Basin M	2/22/2013	ISCO Composite	PAHs	Phenanthrene	0.082	µg/l	=	-	-
Basin M	3/8/2014	Grab	PAHs	Phenanthrene	0.081	µg/l	=	-	-
Basin M	3/9/2014	ISCO Composite	PAHs	Phenanthrene	0.13	µg/l	=	-	-
Basin M	4/13/2015	Composite Drum	PAHs	Phenanthrene	0.042	µg/l	=	0.02	0.005
Basin M	12/3/2015	Composite Drum	PAHs	Phenanthrene	0.131	µg/l	=	0.676	0.338
Basin M	12/17/2015	Composite Drum	PAHs	Phenanthrene	ND	µg/l	U	0.676	0.313
Basin M	1/25/2016	Composite Drum	PAHs	Phenanthrene	ND	µg/l	U	0.676	0.338
Basin M	2/27/2018	Pumped Composite	PAHs	Phenanthrene	0.061	µg/l	=	0.0189	0.00943
Basin M	3/14/2018	Pumped Composite	PAHs	Phenanthrene	0.0307	µg/l	=	0.019	0.00952
Basin M	3/26/2018	Pumped Composite	PAHs	Phenanthrene	0.0359	µg/l	=	0.019	0.00952
Basin N	3/13/2022	ISCO TWC	PAHs	Phenanthrene	ND	µg/l	U	0.0713	0.0357
Basin N	4/4/2022	ISCO TWC	PAHs	Phenanthrene	0.0119	µg/l	J	0.0206	0.0103
Basin N	4/30/2022	ISCO TWC	PAHs	Phenanthrene	ND	µg/l	U	0.0639	0.0319
Basin P	4/29/2022	ISCO TWC-DUP	PAHs	Phenanthrene	0.0344	µg/l	J	0.0656	0.0328
Basin P	3/12/2022	ISCO TWC	PAHs	Phenanthrene	ND	µg/l	U	0.0665	0.0333
Basin P	4/3/2022	ISCO TWC	PAHs	Phenanthrene	0.0392	µg/l	J	0.0738	0.0369
Basin P	4/29/2022	ISCO TWC	PAHs	Phenanthrene	0.0337	µg/l	J	0.0634	0.0317
Basin Q	10/10/2020	ISCO TWC	PAHs	Phenanthrene	ND	µg/l	U	0.0879	0.044
Basin Q	11/6/2020	ISCO TWC	PAHs	Phenanthrene	ND	µg/l	U	0.0792	0.0396
Basin Q	11/6/2020	ISCO TWC-DUP	PAHs	Phenanthrene	ND	µg/l	U	0.0842	0.0421
Basin Q	11/13/2020	ISCO TWC	PAHs	Phenanthrene	ND	µg/l	U	0.0792	0.0396
Basin Q	12/11/2020	ISCO TWC	PAHs	Phenanthrene	0.0206	µg/l	J	0.0215	0.0108
Basin R	11/16/2007	ISCO Composite	PAHs	Phenanthrene	0.089	µg/l	=	-	-
Basin R	11/16/2007	ISCO Composite-DUP	PAHs	Phenanthrene	0.076	µg/l	=	-	-
Basin L	12/26/2022	Grab, Post-SCM	PAHs	Pyrene	0.0467	µg/l	=	-	-
Basin L	1/13/2023	Grab, Post-SCM	PAHs	Pyrene	0.017	µg/l	J	-	-

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin L	2/13/2023	Grab, Post-SCM	PAHs	Pyrene	0.0441	µg/l	=	-	-
Basin L	3/13/2023	Grab, Post-SCM	PAHs	Pyrene	0.0152	µg/l	J	-	-
Basin M	10/23/2010	Grab	PAHs	Pyrene	0.1	µg/l	=	-	-
Basin M	11/6/2010	Grab	PAHs	Pyrene	0.16	µg/l	=	-	-
Basin M	2/12/2011	Grab	PAHs	Pyrene	0.71	µg/l	=	-	-
Basin M	11/11/2012	ISCO Composite	PAHs	Pyrene	0.094	µg/l	=	-	-
Basin M	2/22/2013	ISCO Composite	PAHs	Pyrene	0.24	µg/l	=	-	-
Basin M	3/8/2014	Grab	PAHs	Pyrene	0.56	µg/l	=	-	-
Basin M	3/9/2014	ISCO Composite	PAHs	Pyrene	1.3	µg/l	=	-	-
Basin M	4/13/2015	Composite Drum	PAHs	Pyrene	0.14	µg/l	=	0.02	0.0053
Basin M	12/3/2015	Composite Drum	PAHs	Pyrene	0.499	µg/l	=	0.019	0.00952
Basin M	12/17/2015	Composite Drum	PAHs	Pyrene	1.43	µg/l	=	0.019	0.00952
Basin M	1/25/2016	Composite Drum	PAHs	Pyrene	0.515	µg/l	=	0.019	0.00952
Basin M	2/27/2018	Pumped Composite	PAHs	Pyrene	0.256	µg/l	=	0.0189	0.00943
Basin M	3/14/2018	Pumped Composite	PAHs	Pyrene	0.0894	µg/l	=	0.019	0.00952
Basin M	3/26/2018	Pumped Composite	PAHs	Pyrene	0.131	µg/l	=	0.019	0.00952
Basin N	3/13/2022	ISCO TWC	PAHs	Pyrene	0.0236	µg/l	J	0.0357	0.0178
Basin N	4/4/2022	ISCO TWC	PAHs	Pyrene	0.0212	µg/l	=	0.0206	0.0103
Basin N	4/30/2022	ISCO TWC	PAHs	Pyrene	0.0196	µg/l	J	0.0319	0.016
Basin P	4/29/2022	ISCO TWC-DUP	PAHs	Pyrene	ND	µg/l	U	0.0328	0.0164
Basin P	3/12/2022	ISCO TWC	PAHs	Pyrene	ND	µg/l	U	0.0333	0.0166
Basin P	4/3/2022	ISCO TWC	PAHs	Pyrene	ND	µg/l	U	0.0369	0.0185
Basin P	4/29/2022	ISCO TWC	PAHs	Pyrene	ND	µg/l	U	0.0317	0.0158
Basin Q	10/10/2020	ISCO TWC	PAHs	Pyrene	ND	µg/l	U	0.0879	0.044
Basin Q	11/6/2020	ISCO TWC	PAHs	Pyrene	0.0451	µg/l	J	0.0792	0.0396
Basin Q	11/6/2020	ISCO TWC-DUP	PAHs	Pyrene	0.0472	µg/l	J	0.0842	0.0421
Basin Q	11/13/2020	ISCO TWC	PAHs	Pyrene	0.0507	µg/l	J	0.0792	0.0396
Basin Q	12/11/2020	ISCO TWC	PAHs	Pyrene	0.0556	µg/l	=	0.0215	0.0108
Basin R	11/16/2007	ISCO Composite	PAHs	Pyrene	0.065	µg/l	J	-	-
Basin R	11/16/2007	ISCO Composite-DUP	PAHs	Pyrene	0.041	µg/l	J	-	-
Basin M	10/23/2010	Grab	Metals	Selenium	0.7	µg/l	=	-	-
Basin M	11/6/2010	Grab	Metals	Selenium	0.46	µg/l	J	-	-
Basin M	2/12/2011	Grab	Metals	Selenium	0.25	µg/l	J	-	-

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin M	11/11/2012	ISCO Composite	Metals	Selenium	ND	µg/l	U	-	0.3
Basin M	2/22/2013	ISCO Composite	Metals	Selenium	ND	µg/l	U	-	0.3
Basin R	11/16/2007	ISCO Composite	Metals	Selenium	ND	µg/l	U	-	0.4
Basin R	11/16/2007	ISCO Composite-DUP	Metals	Selenium	ND	µg/l	U	-	0.4
Basin M	10/23/2010	Grab	Metals	Silver	0.092	µg/l	J	-	-
Basin M	11/6/2010	Grab	Metals	Silver	ND	µg/l	U	-	0.071
Basin M	2/12/2011	Grab	Metals	Silver	ND	µg/l	U	-	0.071
Basin M	11/11/2012	ISCO Composite	Metals	Silver	0.039	µg/l	=	-	-
Basin M	2/22/2013	ISCO Composite	Metals	Silver	0.075	µg/l	=	-	-
Basin R	11/16/2007	ISCO Composite	Metals	Silver	0.036	µg/l	=	-	-
Basin R	11/16/2007	ISCO Composite-DUP	Metals	Silver	0.032	µg/l	=	-	-
Basin R	11/16/2007		Misc	Total Organic Carbon	5.3	mg/l	=	-	-
Basin L	12/26/2022	Grab, Post-SCM	PAHs	Total PAHs	0.355	µg/l	=	-	-
Basin L	1/13/2023	Grab, Post-SCM	PAHs	Total PAHs	0.161	µg/l	=	-	-
Basin L	2/13/2023	Grab, Post-SCM	PAHs	Total PAHs	0.333	µg/l	=	-	-
Basin L	3/13/2023	Grab, Post-SCM	PAHs	Total PAHs	0.0809	µg/l	=	-	-
Basin M	10/23/2010	Grab	PAHs	Total PAHs	1.58	µg/l	=	-	0.012
Basin M	11/6/2010	Grab	PAHs	Total PAHs	2.92	µg/l	=	-	-
Basin M	2/12/2011	Grab	PAHs	Total PAHs	6.33	µg/l	=	-	-
Basin M	11/11/2012	ISCO Composite	PAHs	Total PAHs	1.17	µg/l	=	-	-
Basin M	2/22/2013	ISCO Composite	PAHs	Total PAHs	2.49	µg/l	=	-	-
Basin M	3/8/2014	Grab	PAHs	Total PAHs	4.27	µg/l	=	-	-
Basin M	3/9/2014	ISCO Composite	PAHs	Total PAHs	9.15	µg/l	=	-	-
Basin M	4/13/2015	21-day composite	PAHs	Total PAHs	3.66	µg/l	=	0.02	0.01
Basin M	12/3/2015	54-day composite	PAHs	Total PAHs	7.94	µg/l	=	0.676	0.338
Basin M	12/17/2015	14-day composite	PAHs	Total PAHs	15.4	µg/l	=	0.676	0.313
Basin M	1/25/2016	39-day composite	PAHs	Total PAHs	8.26	µg/l	=	0.676	0.338
Basin M	2/27/2018	Pumped Composite	PAHs	Total PAHs	2.87	µg/l	=	0.0377	0.0189
Basin M	3/14/2018	Pumped Composite	PAHs	Total PAHs	1.59	µg/l	=	0.0396	0.0198
Basin M	3/26/2018	Pumped Composite	PAHs	Total PAHs	1.58	µg/l	=	0.0396	0.0198
Basin N	3/13/2022	ISCO TWC	PAHs	Total PAHs	0.191	µg/l	=	0.0713	0.0357
Basin N	4/4/2022	ISCO TWC	PAHs	Total PAHs	0.226	µg/l	=	0.0412	0.0206
Basin N	4/30/2022	ISCO TWC	PAHs	Total PAHs	0.161	µg/l	=	0.0639	0.0319

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin P	4/29/2022	ISCO TWC	PAHs	Total PAHs	0.107	µg/l	=	0.205	0.205
Basin P	3/12/2022	ISCO TWC	PAHs	Total PAHs	0.069	µg/l	=	0.0665	0.0333
Basin P	4/3/2022	ISCO TWC	PAHs	Total PAHs	0.121	µg/l	=	0.0738	0.0369
Basin P	4/29/2022	ISCO TWC-DUP	PAHs	Total PAHs	0.139	µg/l	=	0.0634	0.0317
Basin Q	10/10/2020	ISCO TWC	PAHs	Total PAHs	0.0581	µg/l	=	0.176	0.0879
Basin Q	11/6/2020	ISCO TWC	PAHs	Total PAHs	0.61	µg/l	=	0.158	0.0792
Basin Q	11/6/2020	ISCO TWC-DUP	PAHs	Total PAHs	0.506	µg/l	=	0.168	0.0842
Basin Q	11/13/2020	ISCO TWC	PAHs	Total PAHs	0.259	µg/l	=	0.158	0.0792
Basin Q	12/11/2020	ISCO TWC	PAHs	Total PAHs	0.514	µg/l	=	0.043	0.0215
Basin R	11/16/2007	ISCO Composite-DUP	PAHs	Total PAHs	0.264	µg/l	=	-	0.0046
Basin R	11/16/2007	ISCO Composite	PAHs	Total PAHs	0.545	µg/l	=	-	0.0046
Basin M	10/23/2010		PCBs	Total PCB Aroclors	0.026	µg/l	=	-	0.01
Basin M	11/6/2010		PCBs	Total PCB Aroclors	0.012	µg/l	=	-	0.01
Basin M	2/12/2011		PCBs	Total PCB Aroclors	0.033	µg/l	=	-	0.01
Basin M	11/11/2012		PCBs	Total PCB Aroclors	0.0084	µg/l	=	-	0.0023
Basin M	2/22/2013		PCBs	Total PCB Aroclors	0.044	µg/l	=	-	0.02
Basin Q	10/23/2010		PCBs	Total PCB Aroclors	ND	µg/l	U	-	0.01
Basin Q	2/12/2011		PCBs	Total PCB Aroclors	0.025	µg/l	=	-	0.01
Basin Q	5/11/2011		PCBs	Total PCB Aroclors	0.038	µg/l	=	-	0.02
Basin R	11/16/2007	Dup1	PCBs	Total PCB Aroclors	0.016	µg/l	=	-	0.001
Basin R	11/16/2007		PCBs	Total PCB Aroclors	0.015	µg/l	=	-	0.0011
Basin M	10/23/2010	Grab	Misc	Total Suspended Solids	4	mg/l	=	-	-
Basin M	11/6/2010	Grab	Misc	Total Suspended Solids	ND	mg/l	U	-	1
Basin M	2/12/2011	Grab	Misc	Total Suspended Solids	9	mg/l	=	-	-
Basin M	11/11/2012	ISCO Composite	Misc	Total Suspended Solids	13.5	mg/l	=	-	-
Basin M	2/22/2013	ISCO Composite	Misc	Total Suspended Solids	75.5	mg/l	=	-	-
Basin M	3/8/2014	Grab	Misc	Total Suspended Solids	20.8	mg/l	=	-	-
Basin M	3/9/2014	ISCO Composite	Misc	Total Suspended Solids	24	mg/l	=	-	-
Basin M	4/13/2015	Composite Drum	Misc	Total Suspended Solids	17	mg/l	=	5	-
Basin M	4/13/2015	Composite Drum	Misc	Total Suspended Solids	17	mg/l	=	-	-
Basin M	6/25/2015	Composite Drum	Misc	Total Suspended Solids	466	mg/l	=	-	-
Basin M	12/3/2015	Compostie Drum	Misc	Total Suspended Solids	47.6	mg/l	=	2	2
Basin M	12/17/2015	Composite Drum	Misc	Total Suspended Solids	27.6	mg/l	=	2	2

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL
Basin M	1/25/2016	Composite Drum	Misc	Total Suspended Solids	16	mg/l	=	2	2
Basin M	2/27/2018	Pumped Composite	Misc	Total Suspended Solids	6	mg/l	=	5	5
Basin M	3/14/2018	Pumped Composite	Misc	Total Suspended Solids	15	mg/l	=	5	5
Basin M	3/26/2018	Pumped Composite	Misc	Total Suspended Solids	ND	mg/l	U	5	5
Basin N	3/13/2022	ISCO TWC	Misc	Total Suspended Solids	9	mg/l	=	5	5
Basin N	4/4/2022	ISCO TWC	Misc	Total Suspended Solids	ND	mg/l	UJ	5	5
Basin N	4/30/2022	ISCO TWC	Misc	Total Suspended Solids	5.6	mg/l	=	5	5
Basin P	4/29/2022	ISCO TWC-DUP	Misc	Total Suspended Solids	18.8	mg/l	=	10	10
Basin P	3/12/2022	ISCO TWC	Misc	Total Suspended Solids	ND	mg/l	UJ	9.09	9.09
Basin P	4/3/2022	ISCO TWC	Misc	Total Suspended Solids	20.8	mg/l	=	20	20
Basin P	4/29/2022	ISCO TWC	Misc	Total Suspended Solids	16.4	mg/l	=	10	10
Basin Q	10/10/2020	ISCO TWC	Misc	Total Suspended Solids	ND	mg/l	U	5	5
Basin Q	11/6/2020	ISCO TWC-DUP	Misc	Total Suspended Solids	ND	mg/l	U	5	5
Basin Q	11/6/2020	ISCO TWC	Misc	Total Suspended Solids	ND	mg/l	U	5	5
Basin Q	11/13/2020	ISCO TWC	Misc	Total Suspended Solids	ND	mg/l	U	5	5
Basin Q	12/11/2020	ISCO TWC	Misc	Total Suspended Solids	9	mg/l	=	5	5
Basin R	11/16/2007	ISCO Composite	Misc	Total Suspended Solids	15	mg/l	=	-	-
Basin R	11/16/2007	ISCO Composite-DUP	Misc	Total Suspended Solids	15	mg/l	=	-	-
Basin R	11/16/2007		Misc	Turbidity	4.9	NTU	=	-	-
Basin L	12/26/2022	Grab, Post-SCM	Metals	Zinc	31.8	µg/l	=	-	-
Basin L	1/13/2023	Grab, Post-SCM	Metals	Zinc	26.4	µg/l	=	-	-
Basin L	2/13/2023	Grab, Post-SCM	Metals	Zinc	ND	µg/l	U	180	-
Basin L	3/13/2023	Grab, Post-SCM	Metals	Zinc	19	µg/l	=	-	-
Basin M	10/23/2010	Grab	Metals	Zinc	42	µg/l	=	-	-
Basin M	11/6/2010	Grab	Metals	Zinc	49	µg/l	=	-	-
Basin M	2/12/2011	Grab	Metals	Zinc	116	µg/l	=	-	-
Basin M	11/11/2012	ISCO Composite	Metals	Zinc	30.3	µg/l	=	-	-
Basin M	2/22/2013	ISCO Composite	Metals	Zinc	76.6	µg/l	=	-	-
Basin M	2/27/2018	Pumped Composite	Metals	Zinc	39.3	µg/l	=	4	2
Basin M	3/14/2018	Pumped Composite	Metals	Zinc	66.3	µg/l	=	4	2
Basin M	3/26/2018	Pumped Composite	Metals	Zinc	32.1	µg/l	=	4	2
Basin R	11/16/2007	ISCO Composite	Metals	Zinc	285	µg/l	=	-	-
Basin R	11/16/2007	ISCO Composite-DUP	Metals	Zinc	236	µg/l	=	-	-

Terminal 4 Slip 1 Stormwater Data

Location	Date Sampled	SampleType	Category	Analyte	Result	Units	Qualifier[1]	MRL	MDL

[1]Qualifiers have been carried over as-is from previous reports. Qualifiers are as follows:

= = Analyte is detected at the reported concentration

J = The result is an estimated concentration that is below the Method Reporting Limit (MRL) and above the Method Detection Limit (MDL)

U = The analyte is not detected at or above the reported MDL

UJ = This anlayte was not detected above the reported sample quantiation limit. However, the reported quantitation limit is approximate

APPENDIX B
Rank Order Curves

B.1. METHODS

These rank order curves represent the most recent post-SCM data for each stormwater basin. The data is included in Appendix A. The sources of data for each basin are:

- Basin L – 2024 Stormwater Treatment System Performance Verification Report (MFA, 2024)
- Basin M – 2011 Source Control Completion Report, 2013 Additional Stormwater Sampling Memo, 2014 Additional Source Control Measures Memo, 2016 Source Control Decision Support Data Collection (Geosyntec and GS&P, 2016), 2018 Treatment
- Basin N – 2022 Stormwater Evaluation Report (Geosyntec, 2022)
- Basin O – 2023-2024 data presented in this report
- Basin P – 2022 Stormwater Evaluation Report (Geosyntec, 2022)
- Basin Q – 2021 Stormwater Source Control Evaluation (Geosyntec, 2021)
- Basin R – 2009 Stormwater Source Control Evaluation (Ash Creek, 2009)
- Basin S – 2023-2024 data presented in this report

B.2. STORMWATER PLOTS

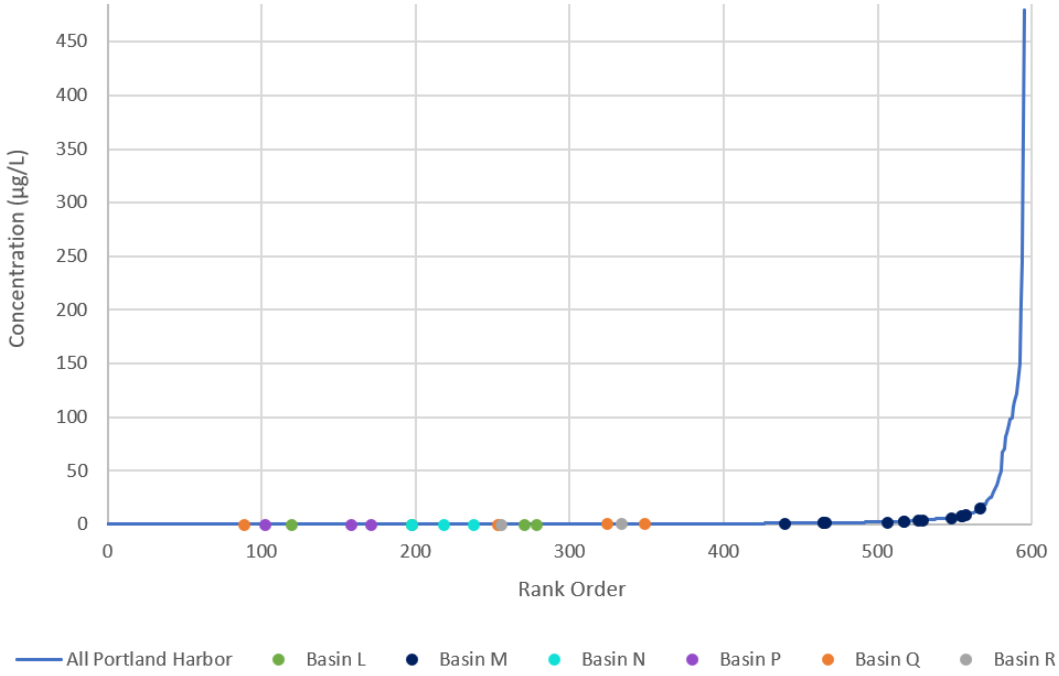

Figure B - 1. Total PAHs in Stormwater at T4 Compared to "Typical" Industrial Stormwater in the Portland Harbor

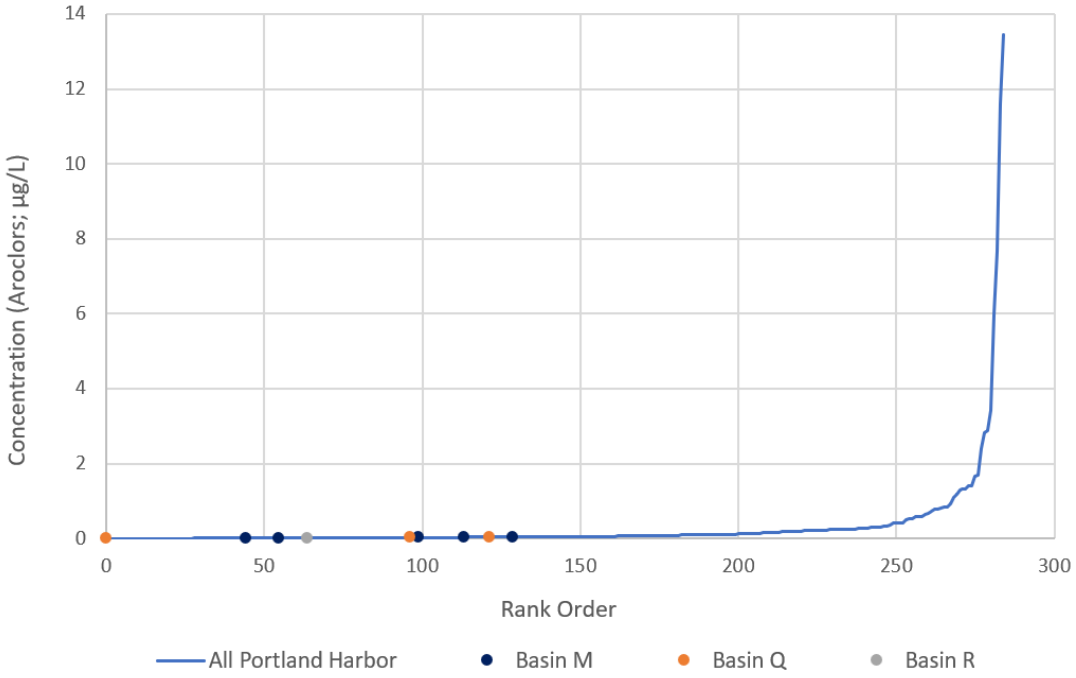

Figure B - 2. Total PCB Aroclors in Stormwater at T4 Compared to "Typical" Industrial Stormwater in the Portland Harbor

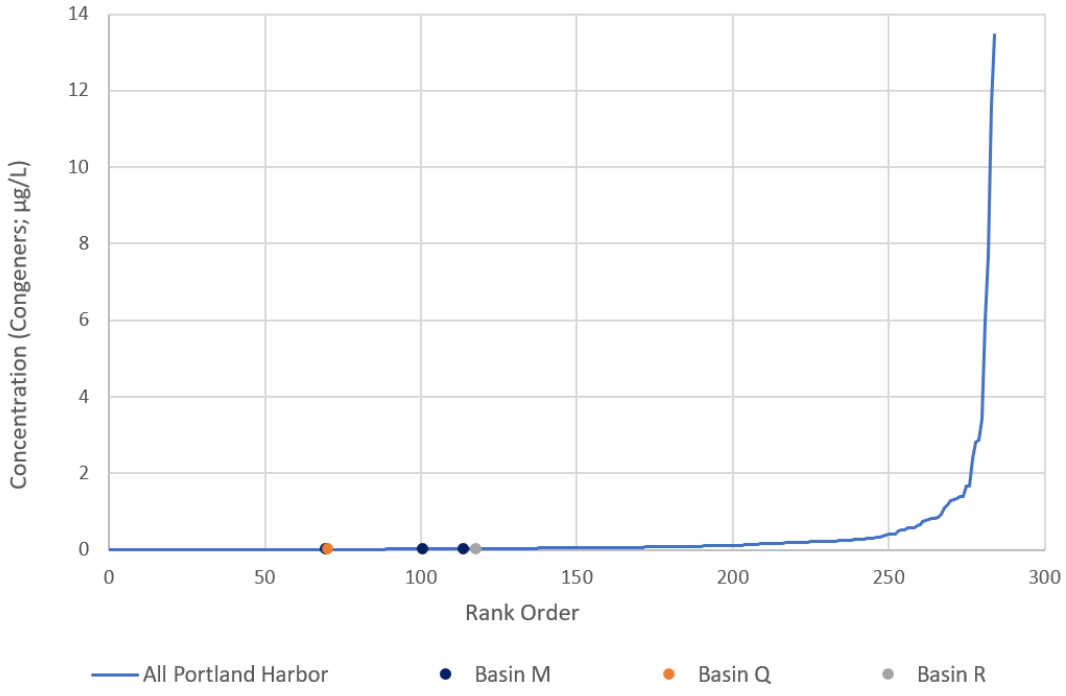

Figure B - 3. Total PCB Congeners in Stormwater at T4 Compared to "Typical" Industrial Stormwater in the Portland Harbor

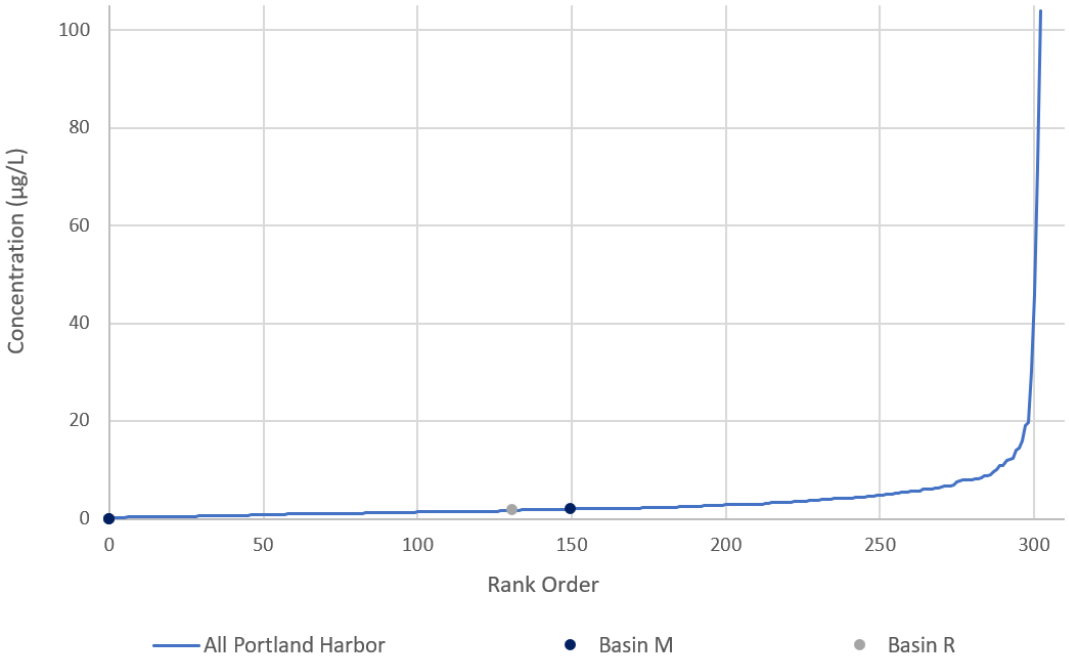

Figure B - 4. BEHP in Stormwater at T4 Compared to "Typical" Industrial Stormwater in

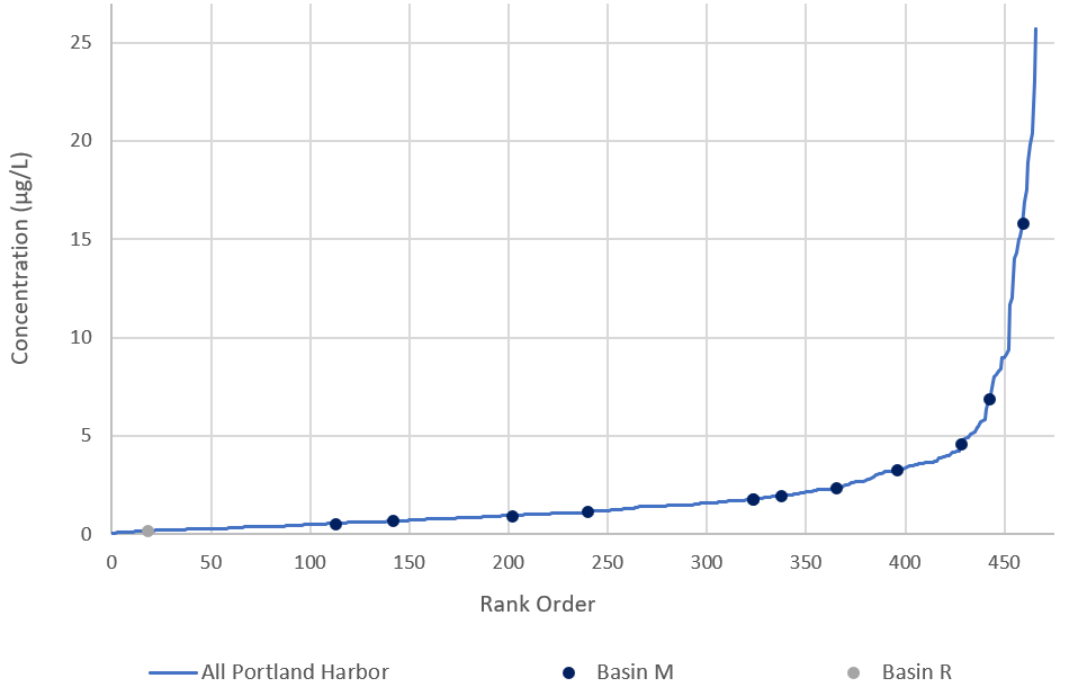

Figure B - 5. Arsenic in Stormwater at T4 Compared to "Typical" Industrial Stormwater in the Portland Harbor

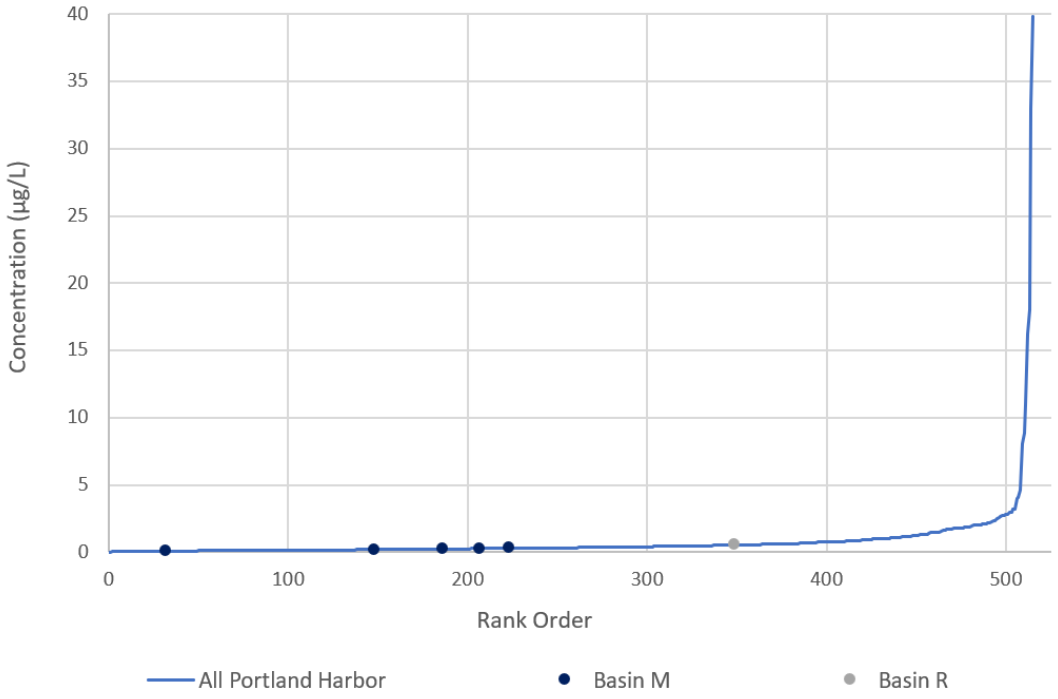

Figure B - 6. Cadmium in Stormwater at T4 Compared to "Typical" Industrial Stormwater in the Portland Harbor

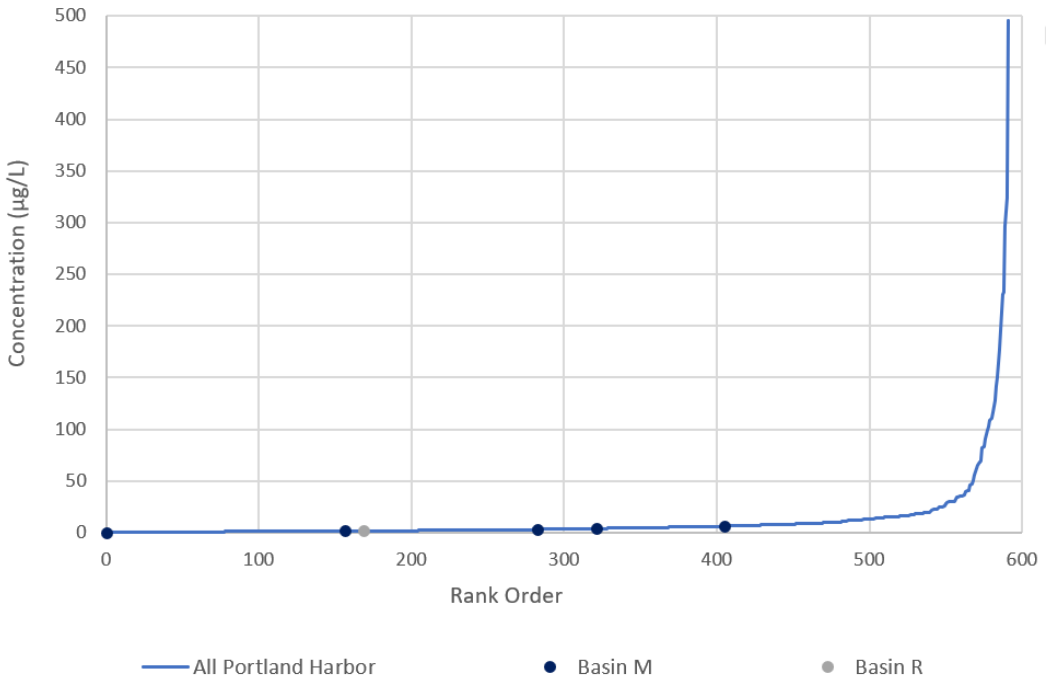

Figure B - 7. Chromium in Stormwater at T4 Compared to "Typical" Industrial Stormwater in the Portland Harbor

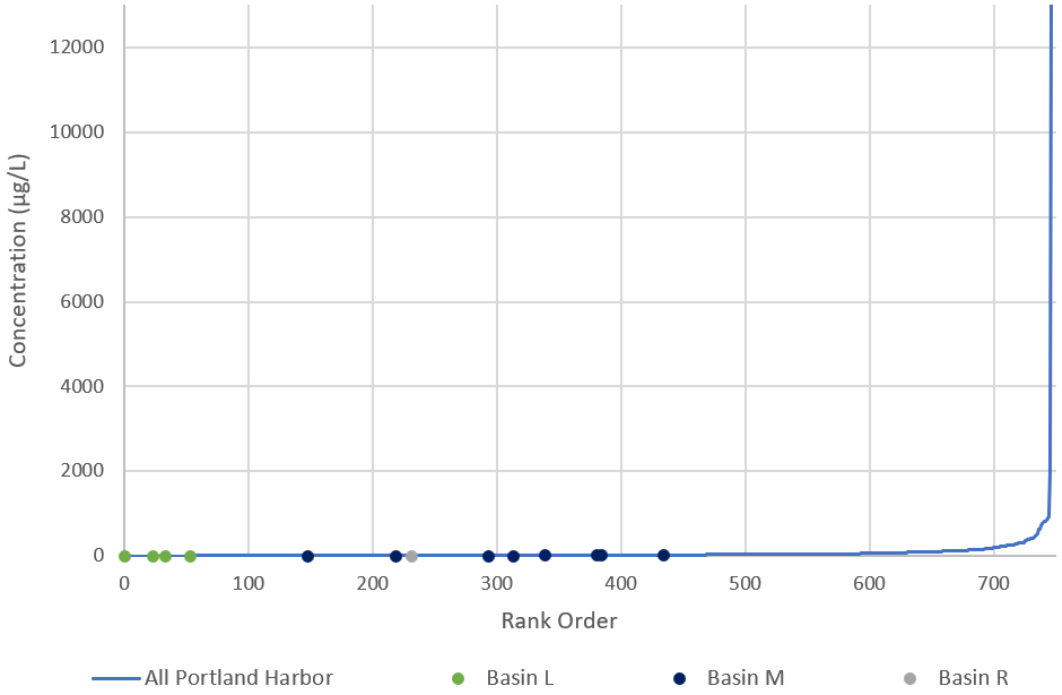

Figure B - 8. Copper in Stormwater at T4 Compared to "Typical" Industrial Stormwater in the Portland Harbor

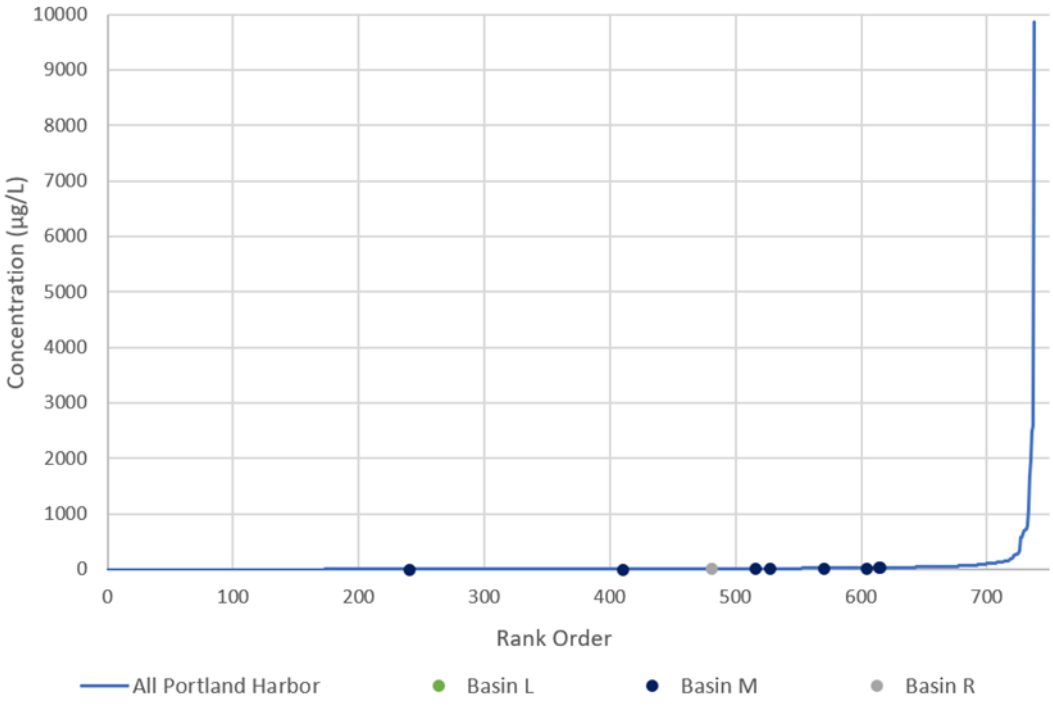

Figure B - 9. Lead in Stormwater at T4 Compared to "Typical" Industrial Stormwater in the Portland Harbor

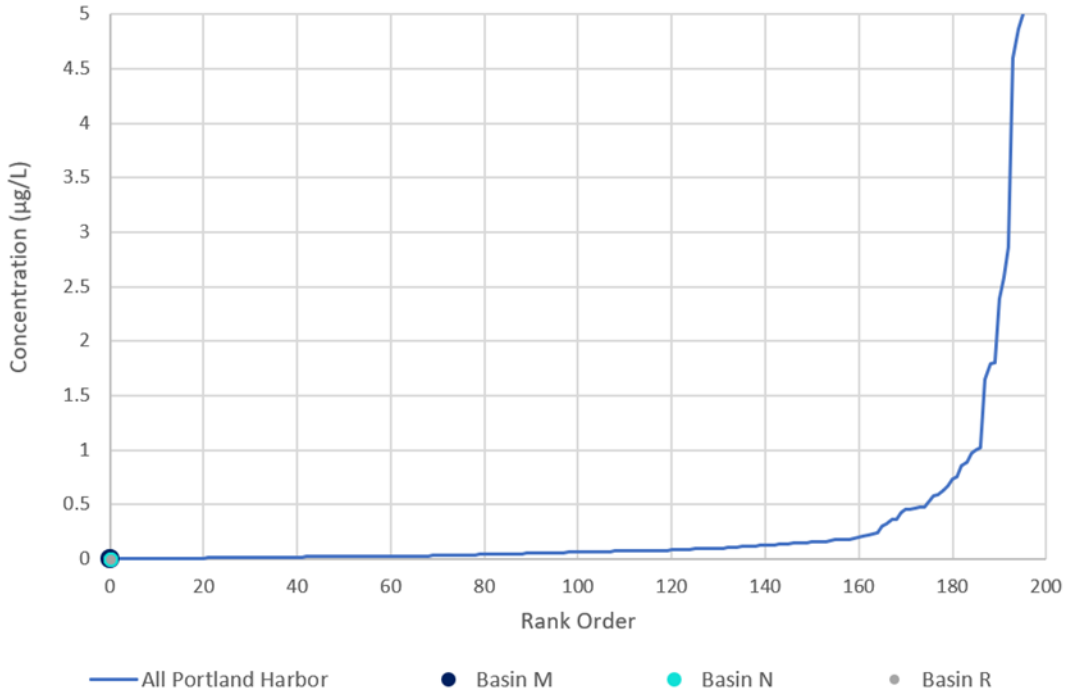

Figure B - 10. Mercury in Stormwater at T4 Compared to "Typical" Industrial Stormwater in the Portland Harbor

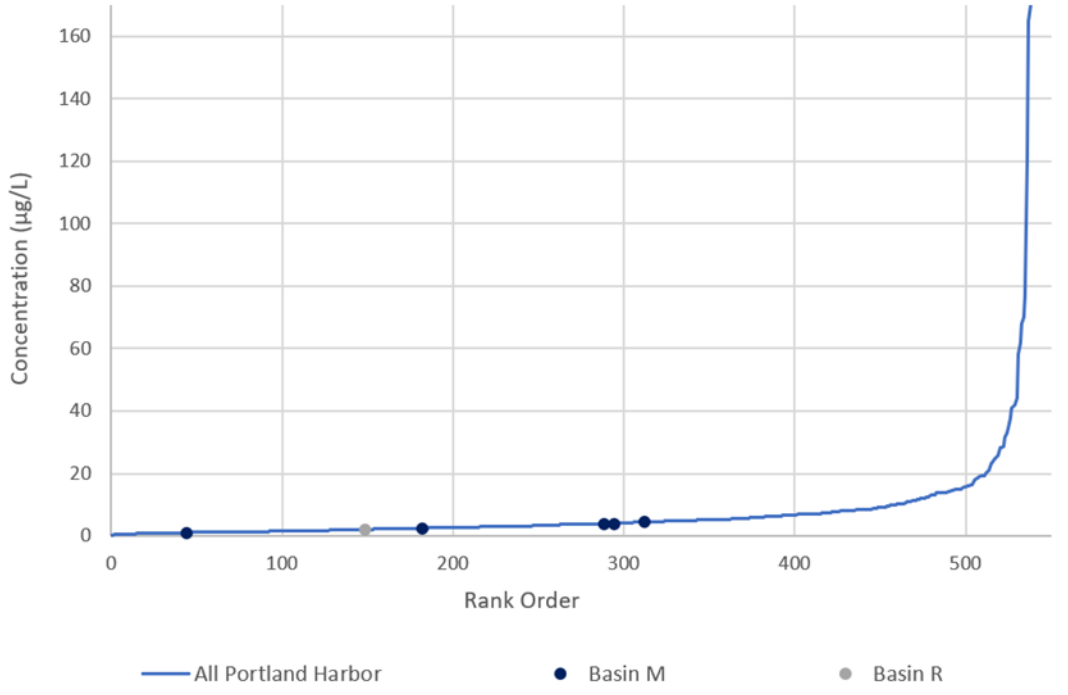

Figure B - 11. Nickel in Stormwater at T4 Compared to "Typical" Industrial Stormwater in the Portland Harbor

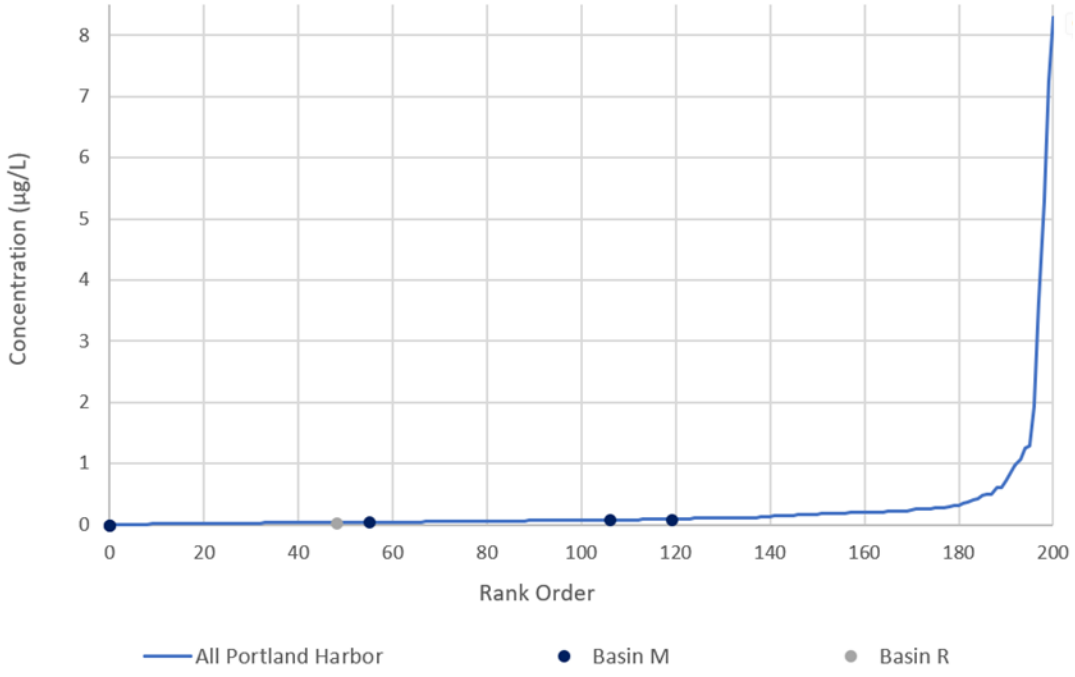

Figure B - 12. Silver in Stormwater at T4 Compared to "Typical" Industrial Stormwater in the Portland Harbor

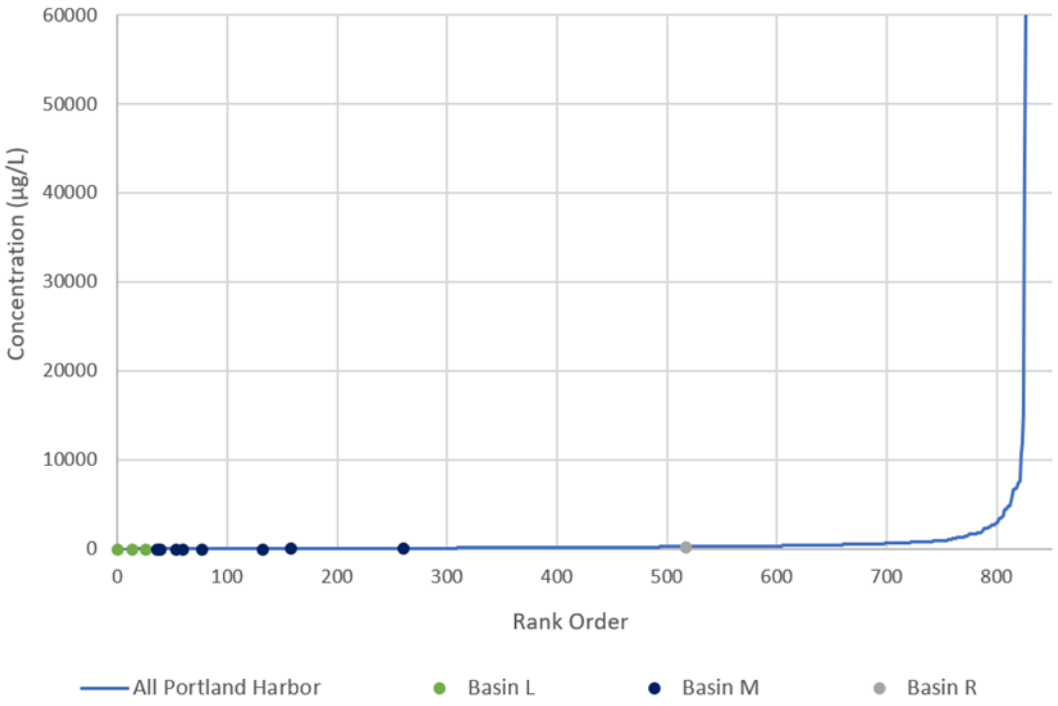

Figure B - 13. Zinc in Stormwater at T4 Compared to "Typical" Industrial Stormwater in the Portland Harbor

APPENDIX C
2023-2024 Storm Hyetographs

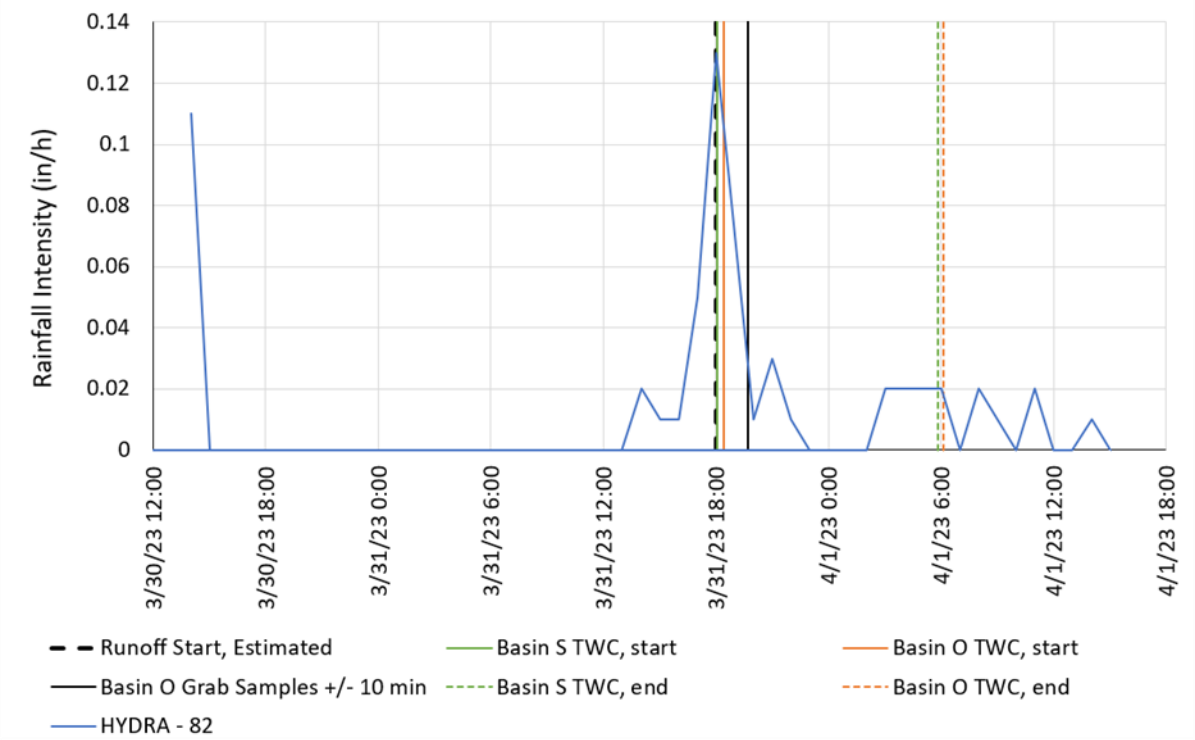

Figure C - 1. Storm Event Hyetograph for 3-31-2023 Sampling Event

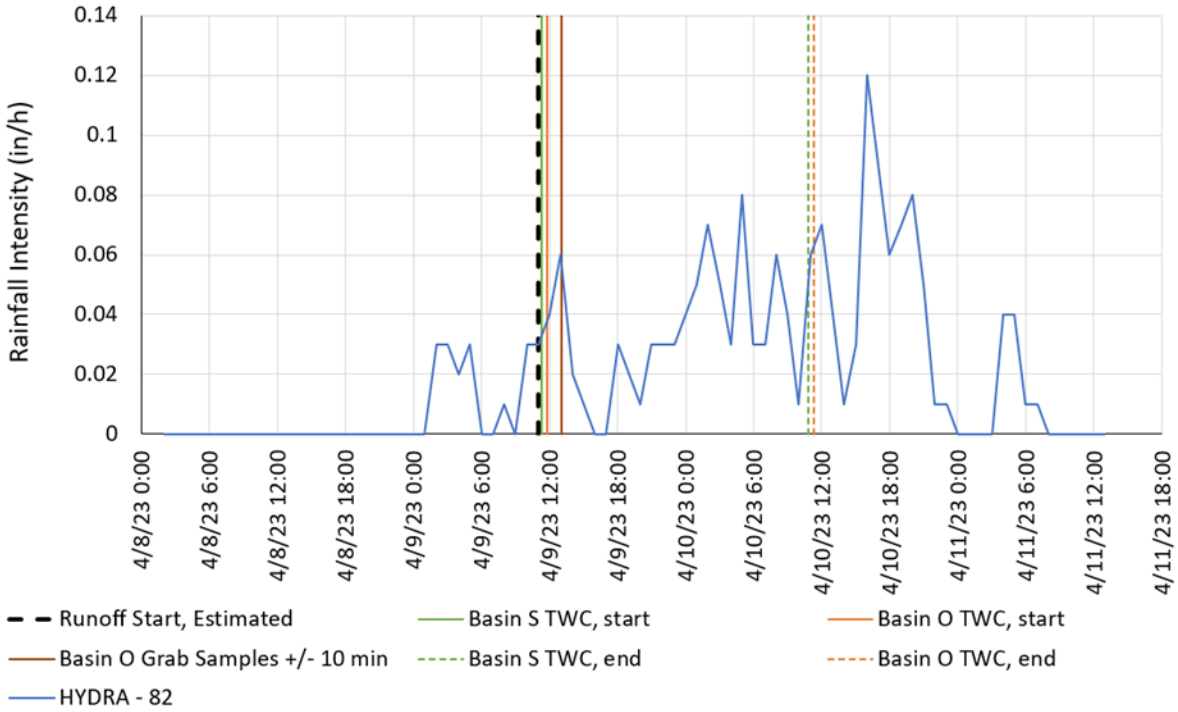

Figure C - 2. Storm Event Hyetograph for 4-9-2023 Sampling Event

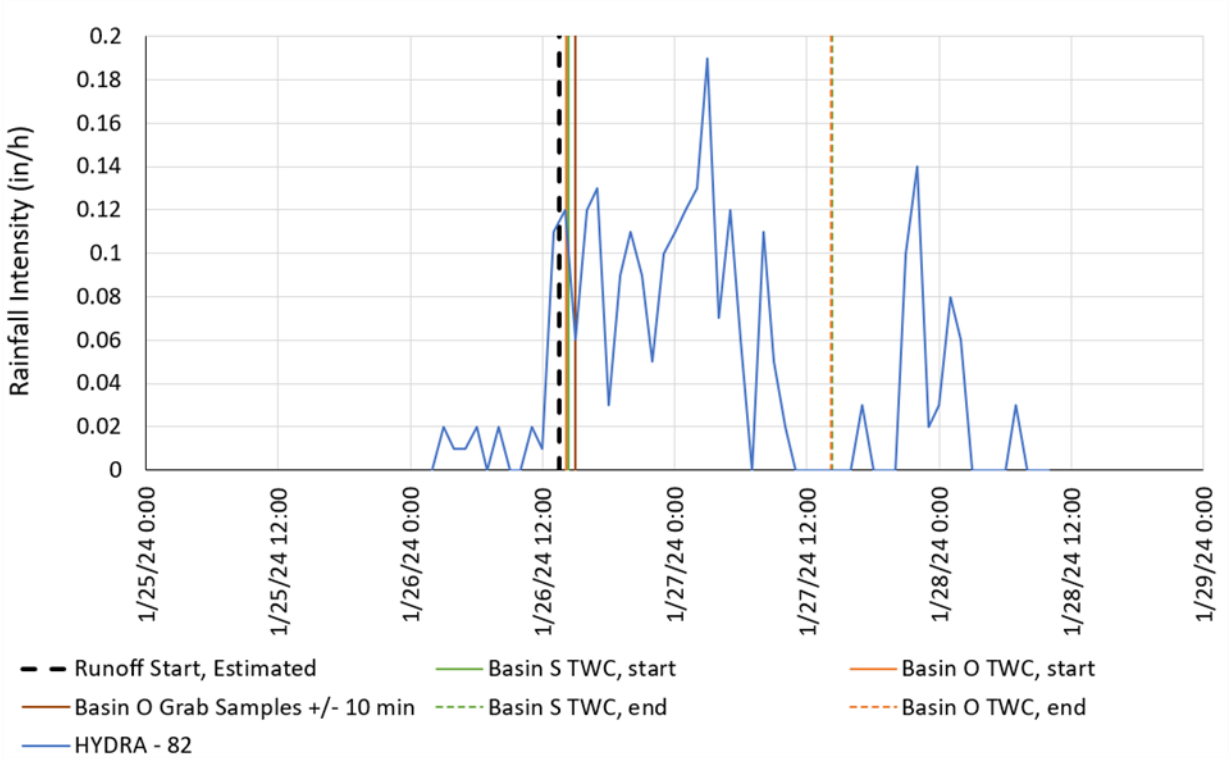

Figure C - 3. Storm Event Hyetograph for 1-26-2024 Sampling Event

APPENDIX D
Autosampler Output Files

D.1. MARCH 31, 2023

BASIN O

********** PROGRAM SETTINGS **********

TIME MODE

250 ml SAMPLES

FIRST SAMPLE AT

* START TIME *

THEN SAMPLE EVERY

0 HOURS, 15 MINUTES

2 SAMPLES / BOTTLE

8 FOOT SUCTION HEAD

********** SAMPLING RESULTS **********

Program Started at: 18:23 31-MAR-23

Nominal Sample Volume = 250 ml

S

O E

SAMPLE	BOTTLE	U C	R R	R O	TIME	DATE	COUNT TO LIQUID
1, 2	1	S			18:23	31-MAR	449
2, 2	1	T			18:38	31-MAR	437
1, 2	2	T			18:53	31-MAR	437
2, 2	2	T			19:08	31-MAR	442
1, 2	3	T			19:23	31-MAR	438
2, 2	3	T			19:38	31-MAR	437
1, 2	4	T			19:53	31-MAR	437
2, 2	4	T			20:08	31-MAR	437
1, 2	5	T			20:23	31-MAR	438
2, 2	5	T			20:38	31-MAR	440
1, 2	6	T			20:53	31-MAR	438
2, 2	6	T			21:08	31-MAR	470
1, 2	7	T	NL		21:23	31-MAR	0
2, 2	7	T	NL		21:38	31-MAR	0
1, 2	8	T	NL		21:53	31-MAR	0
2, 2	8	T	NL		22:08	31-MAR	0
1, 2	9	T			22:23	31-MAR	451
2, 2	9	T			22:38	31-MAR	470
1, 2	10	T	NL		22:53	31-MAR	0
2, 2	10	T	NL		23:08	31-MAR	0
1, 2	11	T	NL		23:23	31-MAR	0

2, 2	11	T	NL	23:38	31-MAR	0
1, 2	12	T	NL	23:53	31-MAR	0
2, 2	12	T	NL	0:08	1-APR	0
1, 2	13	T	NL	0:23	1-APR	0
2, 2	13	T	NL	0:38	1-APR	0
1, 2	14	T	NL	0:53	1-APR	0
2, 2	14	T	NL	1:08	1-APR	0
1, 2	15	T	NL	1:23	1-APR	0
2, 2	15	T	NL	1:38	1-APR	0
1, 2	16	T	NL	1:53	1-APR	0
2, 2	16	T	NL	2:08	1-APR	0
1, 2	17	T	NL	2:23	1-APR	0
2, 2	17	T	NL	2:38	1-APR	0
1, 2	18	T	NL	2:53	1-APR	0
2, 2	18	T	NL	3:08	1-APR	0
1, 2	19	T	NL	3:23	1-APR	0
2, 2	19	T	NL	3:38	1-APR	0
1, 2	20	T	NL	3:53	1-APR	0
2, 2	20	T	NL	4:08	1-APR	0
1, 2	21	T	NL	4:23	1-APR	0
2, 2	21	T	NL	4:38	1-APR	0
1, 2	22	T	NL	4:53	1-APR	0
2, 2	22	T	NL	5:08	1-APR	1866
1, 2	23	T	NL	5:23	1-APR	0
2, 2	23	T	NL	5:38	1-APR	0
1, 2	24	T	NL	5:53	1-APR	1879

2, 2 24 T NL 6:08 1-APR 0

Program Finished at: 6:09 1-APR

SOURCE: T ==> TIME

SOURCE: S ==> START

ERROR: NL ==> NO LIQUID DETECTED!

BASIN S

********** PROGRAM SETTINGS **********

TIME MODE

250 ml SAMPLES

FIRST SAMPLE AT

* START TIME *

THEN SAMPLE EVERY

0 HOURS, 15 MINUTES

2 SAMPLES / BOTTLE

10 FOOT SUCTION HEAD

********** SAMPLING RESULTS **********

Program Started at: 18:04 31-MAR-23

Nominal Sample Volume = 250 ml

SAMPLE	BOTTLE	S O U R C E	E R R O R	TIME	DATE	COUNT TO LIQUID
1, 2	1	S		18:04	31-MAR	679
2, 2	1	T		18:19	31-MAR	809
1, 2	2	T		18:34	31-MAR	706
2, 2	2	T		18:49	31-MAR	688
1, 2	3	T		19:04	31-MAR	694
2, 2	3	T		19:19	31-MAR	688
1, 2	4	T		19:34	31-MAR	689
2, 2	4	T		19:49	31-MAR	689
1, 2	5	T		20:04	31-MAR	689
2, 2	5	T		20:19	31-MAR	695
1, 2	6	T		20:34	31-MAR	695
2, 2	6	T		20:49	31-MAR	682
1, 2	7	T		21:04	31-MAR	689
2, 2	7	T		21:19	31-MAR	689
1, 2	8	T		21:34	31-MAR	695
2, 2	8	T		21:49	31-MAR	700

1, 2	9	T		22:04	31-MAR	695
2, 2	9	T		22:19	31-MAR	682
1, 2	10	T		22:34	31-MAR	685
2, 2	10	T		22:49	31-MAR	683
1, 2	11	T		23:04	31-MAR	695
2, 2	11	T		23:19	31-MAR	689
1, 2	12	T		23:34	31-MAR	688
2, 2	12	T		23:49	31-MAR	683
1, 2	13	T		0:04	1-APR	683
2, 2	13	T		0:19	1-APR	684
1, 2	14	T		0:34	1-APR	665
2, 2	14	T	NM	0:49	1-APR	758
1, 2	15	T	NL	1:04	1-APR	0
2, 2	15	T	NL	1:19	1-APR	0
1, 2	16	T	NL	1:34	1-APR	1877
2, 2	16	T	NL	1:49	1-APR	0
1, 2	17	T	NL	2:04	1-APR	0
2, 2	17	T	NL	2:19	1-APR	0
1, 2	18	T	NL	2:34	1-APR	0
2, 2	18	T	NL	2:49	1-APR	0
1, 2	19	T	NL	3:04	1-APR	0
2, 2	19	T	NL	3:19	1-APR	0
1, 2	20	T	NL	3:34	1-APR	0
2, 2	20	T	NL	3:49	1-APR	0
1, 2	21	T		4:04	1-APR	695
2, 2	21	T		4:19	1-APR	688

1, 2 22 T 4:34 1-APR 685

2, 2 22 T 4:49 1-APR 690

1, 2 23 T 5:04 1-APR 685

2, 2 23 T 5:19 1-APR 684

1, 2 24 T 5:34 1-APR 700

2, 2 24 T 5:49 1-APR 718

Program Finished at: 5:50 1-APR

SOURCE: T ==> TIME

SOURCE: S ==> START

ERROR: NL ==> NO LIQUID DETECTED!

ERROR: NM ==> NO MORE LIQUID!

D.2. APRIL 9, 2023

BASIN O

********** PROGRAM SETTINGS **********

TIME MODE

250 ml SAMPLES

FIRST SAMPLE AT

* START TIME *

THEN SAMPLE EVERY

0 HOURS, 30 MINUTES

2 SAMPLES / BOTTLE

8 FOOT SUCTION HEAD

********** SAMPLING RESULTS **********

Program Started at: 11:49 9-APR-23

Nominal Sample Volume = 250 ml

SAMPLE	BOTTLE	S O U R C	E R R O	COUNT TO	TIME	DATE	LIQUID
1, 2	1	S			11:49	9-APR	551
2, 2	1	T			12:19	9-APR	546
1, 2	2	T			12:49	9-APR	552
2, 2	2	T			13:19	9-APR	551
1, 2	3	T			13:49	9-APR	540
2, 2	3	T			14:19	9-APR	544
1, 2	4	T			14:49	9-APR	546

2, 2	4	T		15:19	9-APR	566
1, 2	5	T		15:49	9-APR	540
2, 2	5	T		16:19	9-APR	534
1, 2	6	T		16:49	9-APR	532
2, 2	6	T		17:19	9-APR	556
1, 2	7	T	NL	17:49	9-APR	0
2, 2	7	T	NL	18:19	9-APR	0
1, 2	8	T	NL	18:49	9-APR	0
2, 2	8	T		19:19	9-APR	551
1, 2	9	T		19:49	9-APR	540
2, 2	9	T		20:19	9-APR	539
1, 2	10	T		20:49	9-APR	521
2, 2	10	T		21:19	9-APR	545
1, 2	11	T		21:49	9-APR	552
2, 2	11	T		22:19	9-APR	548
1, 2	12	T		22:49	9-APR	546
2, 2	12	T		23:19	9-APR	546
1, 2	13	T		23:49	9-APR	547
2, 2	13	T		0:19	10-APR	552
1, 2	14	T		0:49	10-APR	552
2, 2	14	T		1:19	10-APR	551
1, 2	15	T		1:49	10-APR	539
2, 2	15	T		2:19	10-APR	546
1, 2	16	T		2:49	10-APR	557
2, 2	16	T		3:19	10-APR	551
1, 2	17	T		3:49	10-APR	540

2, 2 17 T 4:19 10-APR 557

1, 2 18 T 4:49 10-APR 557

2, 2 18 T 5:19 10-APR 558

1, 2 19 T 5:49 10-APR 557

2, 2 19 T 6:19 10-APR 559

1, 2 20 T 6:49 10-APR 557

2, 2 20 T 7:19 10-APR 560

1, 2 21 T 7:49 10-APR 539

2, 2 21 T 8:19 10-APR 548

1, 2 22 T 8:49 10-APR 542

2, 2 22 T 9:19 10-APR 554

1, 2 23 T 9:49 10-APR 547

2, 2 23 T 10:19 10-APR 546

1, 2 24 T 10:49 10-APR 590

2, 2 24 T 11:19 10-APR 532

Program Finished at: 11:20 10-APR

SOURCE: T ==> TIME

SOURCE: S ==> START

ERROR: NL ==> NO LIQUID DETECTED!

BASIN S

********** PROGRAM SETTINGS **********

TIME MODE

250 ml SAMPLES

FIRST SAMPLE AT

* START TIME *

THEN SAMPLE EVERY

0 HOURS, 30 MINUTES

2 SAMPLES / BOTTLE

10 FOOT SUCTION HEAD

********** SAMPLING RESULTS **********

Program Started at: 11:20 9-APR-23

Nominal Sample Volume = 250 ml

SAMPLE	BOTTLE	S O U R C E	R R C O	TIME	DATE	COUNT TO LIQUID
1, 2	1	S		11:20	9-APR	698
2, 2	1	T		11:50	9-APR	703

1, 2	2	T		12:20	9-APR	714
2, 2	2	T		12:50	9-APR	698
1, 2	3	T		13:20	9-APR	699
2, 2	3	T		13:50	9-APR	701
1, 2	4	T		14:20	9-APR	705
2, 2	4	T		14:50	9-APR	698
1, 2	5	T		15:20	9-APR	690
2, 2	5	T		15:50	9-APR	694
1, 2	6	T		16:20	9-APR	714
2, 2	6	T		16:50	9-APR	690
1, 2	7	T		17:20	9-APR	696
2, 2	7	T	NL	17:50	9-APR	1867
1, 2	8	T	NL	18:20	9-APR	1867
2, 2	8	T		18:50	9-APR	703
1, 2	9	T		19:20	9-APR	697
2, 2	9	T		19:50	9-APR	697
1, 2	10	T		20:20	9-APR	688
2, 2	10	T		20:50	9-APR	699
1, 2	11	T		21:20	9-APR	706
2, 2	11	T		21:50	9-APR	689
1, 2	12	T		22:20	9-APR	682
2, 2	12	T		22:50	9-APR	703
1, 2	13	T		23:20	9-APR	690
2, 2	13	T		23:50	9-APR	688
1, 2	14	T		0:20	10-APR	696
2, 2	14	T		0:50	10-APR	680

1, 2 15 T 1:20 10-APR 678

2, 2 15 T 1:50 10-APR 688

1, 2 16 T 2:20 10-APR 689

2, 2 16 T 2:50 10-APR 702

1, 2 17 T 3:20 10-APR 692

2, 2 17 T 3:50 10-APR 682

1, 2 18 T 4:20 10-APR 688

2, 2 18 T 4:50 10-APR 695

1, 2 19 T 5:20 10-APR 677

2, 2 19 T 5:50 10-APR 683

1, 2 20 T 6:20 10-APR 671

2, 2 20 T 6:50 10-APR 694

1, 2 21 T 7:20 10-APR 688

2, 2 21 T 7:50 10-APR 683

1, 2 22 T 8:20 10-APR 697

2, 2 22 T 8:50 10-APR 689

1, 2 23 T 9:20 10-APR 689

2, 2 23 T 9:50 10-APR 690

1, 2 24 T 10:20 10-APR 712

2, 2 24 T 10:50 10-APR 676

Program Finished at: 10:51 10-APR

SOURCE: T ==> TIME

SOURCE: S ==> START

ERROR: NL ==> NO LIQUID DETECTED!

D.3. JANUARY 26, 2024

BASIN O

********** PROGRAM SETTINGS **********

TIME MODE

250 ml SAMPLES

FIRST SAMPLE AT

* START TIME *

THEN SAMPLE EVERY

0 HOURS, 30 MINUTES

2 SAMPLES / BOTTLE

8 FOOT SUCTION HEAD

********** SAMPLING RESULTS **********

Program Started at: 14:09 26-JAN-24

Nominal Sample Volume = 250 ml

S

```
          O   E
          U   R
          R   R          COUNT
          C   O            TO
SAMPLE BOTTLE  E   R   TIME  DATE LIQUID
______ ______  _   _   ____  ____ ______
 1, 2     1    S      14:09 26-JAN  486
 2, 2     1    T      14:39 26-JAN  486
 1, 2     2    T      15:09 26-JAN  485
 2, 2     2    T      15:39 26-JAN  488
 1, 2     3    T      16:09 26-JAN  482
 2, 2     3    T      16:39 26-JAN  480
 1, 2     4    T      17:09 26-JAN  484
 2, 2     4    T      17:39 26-JAN  486
 1, 2     5    T      18:09 26-JAN  480
 2, 2     5    T      18:39 26-JAN  484
 1, 2     6    T      19:09 26-JAN  480
 2, 2     6    T      19:39 26-JAN  480
 1, 2     7    T      20:09 26-JAN  481
 2, 2     7    T      20:39 26-JAN  480
 1, 2     8    T      21:09 26-JAN  481
 2, 2     8    T      21:39 26-JAN  480
 1, 2     9    T      22:09 26-JAN  485
 2, 2     9    T      22:39 26-JAN  480
 1, 2    10    T      23:09 26-JAN  480
 2, 2    10    T      23:39 26-JAN  479
```

1, 2 11 T 0:09 27-JAN 480

2, 2 11 T 0:39 27-JAN 480

1, 2 12 T 1:09 27-JAN 479

2, 2 12 T 1:39 27-JAN 479

1, 2 13 T 2:09 27-JAN 480

2, 2 13 T 2:39 27-JAN 486

1, 2 14 T 3:09 27-JAN 479

2, 2 14 T 3:39 27-JAN 476

1, 2 15 T 4:09 27-JAN 480

2, 2 15 T 4:39 27-JAN 482

1, 2 16 T 5:09 27-JAN 482

2, 2 16 T 5:39 27-JAN 480

1, 2 17 T 6:09 27-JAN 479

2, 2 17 T 6:39 27-JAN 480

1, 2 18 T 7:09 27-JAN 482

2, 2 18 T 7:39 27-JAN 492

1, 2 19 T 8:09 27-JAN 599

2, 2 19 T 8:39 27-JAN 480

1, 2 20 T 9:09 27-JAN 479

2, 2 20 T 9:39 27-JAN 480

1, 2 21 T 10:09 27-JAN 480

2, 2 21 T 10:39 27-JAN 480

1, 2 22 T 11:09 27-JAN 480

2, 2 22 T NL 11:39 27-JAN 1864

1, 2 23 T NL 12:09 27-JAN 0

2, 2 23 T NL 12:39 27-JAN 0

1, 2 24 T NL 13:09 27-JAN 0

2, 2 24 T NL 13:39 27-JAN 0

Program Finished at: 13:40 27-JAN

SOURCE: T ==> TIME

SOURCE: S ==> START

ERROR: NL ==> NO LIQUID DETECTED!

BASIN S

********** PROGRAM SETTINGS **********

TIME MODE

250 ml SAMPLES

FIRST SAMPLE AT

* START TIME *

THEN SAMPLE EVERY

0 HOURS, 30 MINUTES

2 SAMPLES / BOTTLE

10 FOOT SUCTION HEAD

********** SAMPLING RESULTS **********

Program Started at: 14:02 26-JAN-24

Nominal Sample Volume = 250 ml

SAMPLE	BOTTLE	S O U R C	E R R O	COUNT TO	TIME	DATE	LIQUID
1, 2	1	S			14:02	26-JAN	751
2, 2	1	T			14:32	26-JAN	695
1, 2	2	T			15:02	26-JAN	685
2, 2	2	T			15:32	26-JAN	691
1, 2	3	T			16:02	26-JAN	688
2, 2	3	T			16:32	26-JAN	689
1, 2	4	T			17:02	26-JAN	685
2, 2	4	T			17:32	26-JAN	689
1, 2	5	T			18:02	26-JAN	690
2, 2	5	T			18:32	26-JAN	689
1, 2	6	T			19:02	26-JAN	688
2, 2	6	T			19:32	26-JAN	688
1, 2	7	T			20:02	26-JAN	684
2, 2	7	T			20:32	26-JAN	689
1, 2	8	T			21:02	26-JAN	683

2, 2 8 T 21:32 26-JAN 681

1, 2 9 T 22:02 26-JAN 689

2, 2 9 T 22:32 26-JAN 674

1, 2 10 T 23:02 26-JAN 681

2, 2 10 T 23:32 26-JAN 689

1, 2 11 T 0:02 27-JAN 670

2, 2 11 T 0:32 27-JAN 688

1, 2 12 T 1:02 27-JAN 681

2, 2 12 T 1:32 27-JAN 684

1, 2 13 T 2:02 27-JAN 670

2, 2 13 T 2:32 27-JAN 678

1, 2 14 T 3:02 27-JAN 674

2, 2 14 T 3:32 27-JAN 682

1, 2 15 T 4:02 27-JAN 685

2, 2 15 T 4:32 27-JAN 677

1, 2 16 T 5:02 27-JAN 679

2, 2 16 T 5:32 27-JAN 678

1, 2 17 T 6:02 27-JAN 682

2, 2 17 T 6:32 27-JAN 680

1, 2 18 T NL 7:02 27-JAN 1865

2, 2 18 T NL 7:32 27-JAN 0

1, 2 19 T NL 8:02 27-JAN 0

2, 2 19 T 8:32 27-JAN 679

1, 2 20 T 9:02 27-JAN 685

2, 2 20 T NL 9:32 27-JAN 1877

1, 2 21 T 10:02 27-JAN 685

2, 2 21 T 10:32 27-JAN 688

1, 2 22 T NL 11:02 27-JAN 0

2, 2 22 T NL 11:32 27-JAN 0

1, 2 23 T NL 12:02 27-JAN 0

2, 2 23 T NL 12:32 27-JAN 0

1, 2 24 T NL 13:02 27-JAN 0

2, 2 24 T NL 13:32 27-JAN 0

Program Finished at: 13:34 27-JAN

SOURCE: T ==> TIME

SOURCE: S ==> START

ERROR: NL ==> NO LIQUID DETECTED!

APPENDIX E
Laboratory Data and Data Validation Reports

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

Tuesday, April 18, 2023

Ariel Mosbrucker
Geosyntec Consultants, Inc
920 SW Sixth Avenue, Suite 600
Portland, OR 97204

RE: A3D0709 - POP - T4 Stormwater - PNW0319AR

Thank you for using Apex Laboratories. We greatly appreciate your business and strive to provide the highest quality services to the environmental industry.

Enclosed are the results of analyses for work order A3D0709, which was received by the laboratory on 4/1/2023 at 10:05:00AM.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: DAuvil@apex-labs.com, or by phone at 503-718-2323.

Please note: All samples will be disposed of within 30 days of sample receipt, unless prior arrangements have been made.

Cooler Receipt Information

(See Cooler Receipt Form for details)

Default Cooler	2.3 degC

This Final Report is the official version of the data results for this sample submission, unless superseded by a subsequent, labeled amended report.
All other deliverables derived from this data, including Electronic Data Deliverables (EDDs), CLP-like forms, client requested summary sheets, and all other products are considered secondary to this report.

Apex Laboratories

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Darrell Auvil, Client Services Manager

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0319AR**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A3D0709 - 04 18 23 1649**

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
STSMH2710	A3D0709-01	Water	03/31/23 19:37	04/01/23 10:05
STSMH2603	A3D0709-02	Water	03/31/23 19:40	04/01/23 10:05
STSMH2615	A3D0709-03	Water	03/31/23 19:46	04/01/23 10:05
STSMH2712	A3D0709-04	Water	04/01/23 07:30	04/01/23 10:05
STSMH1914	A3D0709-05	Water	04/01/23 07:30	04/01/23 10:05

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ANALYTICAL REPORT

Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0319AR**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A3D0709 - 04 18 23 1649**

ANALYTICAL SAMPLE RESULTS

Polychlorinated Biphenyls by EPA 8082A

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
STSMH1914 (A3D0709-05)				**Matrix: Water**		**Batch: 23D0533**		**C-07**
Aroclor 1016	ND	0.00943	0.0189	ug/L	1	04/14/23 09:40	EPA 8082A	
Aroclor 1221	ND	0.00943	0.0189	ug/L	1	04/14/23 09:40	EPA 8082A	
Aroclor 1232	ND	0.00943	0.0189	ug/L	1	04/14/23 09:40	EPA 8082A	
Aroclor 1242	ND	0.00943	0.0189	ug/L	1	04/14/23 09:40	EPA 8082A	
Aroclor 1248	ND	0.00943	0.0189	ug/L	1	04/14/23 09:40	EPA 8082A	
Aroclor 1254	ND	0.00943	0.0189	ug/L	1	04/14/23 09:40	EPA 8082A	
Aroclor 1260	ND	0.00943	0.0189	ug/L	1	04/14/23 09:40	EPA 8082A	
Aroclor 1262	ND	0.00943	0.0189	ug/L	1	04/14/23 09:40	EPA 8082A	
Aroclor 1268	ND	0.00943	0.0189	ug/L	1	04/14/23 09:40	EPA 8082A	
Surrogate: Decachlorobiphenyl (Surr)		*Recovery: 55 %*		*Limits: 40-135 %*	*1*	*04/14/23 09:40*	*EPA 8082A*	

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503-718-2323
ORELAP ID: OR100062

ANALYTICAL REPORT

Geosyntec Consultants, Inc	Project: POP - T4 Stormwater	
920 SW Sixth Avenue, Suite 600	Project Number: PNW0319AR	Report ID:
Portland, OR 97204	Project Manager: Ariel Mosbrucker	A3D0709 - 04 18 23 1649

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
STSMH2712 (A3D0709-04)				**Matrix: Water**		**Batch: 23D0030**		
Acenaphthene	ND	0.0182	0.0363	ug/L	1	04/03/23 19:13	EPA 8270E LVI	
Acenaphthylene	ND	0.0182	0.0363	ug/L	1	04/03/23 19:13	EPA 8270E LVI	
Anthracene	**0.0300**	0.0182	0.0363	ug/L	1	04/03/23 19:13	EPA 8270E LVI	**J**
Benz(a)anthracene	**0.0177**	0.00908	0.0182	ug/L	1	04/03/23 19:13	EPA 8270E LVI	**J**
Benzo(a)pyrene	**0.0309**	0.00908	0.0182	ug/L	1	04/03/23 19:13	EPA 8270E LVI	
Benzo(b)fluoranthene	**0.0626**	0.00908	0.0182	ug/L	1	04/03/23 19:13	EPA 8270E LVI	
Benzo(k)fluoranthene	**0.0209**	0.00908	0.0182	ug/L	1	04/03/23 19:13	EPA 8270E LVI	**M-05**
Benzo(g,h,i)perylene	**0.0340**	0.0182	0.0363	ug/L	1	04/03/23 19:13	EPA 8270E LVI	**J**
Chrysene	**0.0250**	0.00908	0.0182	ug/L	1	04/03/23 19:13	EPA 8270E LVI	
Dibenz(a,h)anthracene	**0.0104**	0.00908	0.0182	ug/L	1	04/03/23 19:13	EPA 8270E LVI	**J**
Fluoranthene	**0.0340**	0.0182	0.0363	ug/L	1	04/03/23 19:13	EPA 8270E LVI	**J**
Fluorene	ND	0.0182	0.0363	ug/L	1	04/03/23 19:13	EPA 8270E LVI	
Indeno(1,2,3-cd)pyrene	**0.0322**	0.00908	0.0182	ug/L	1	04/03/23 19:13	EPA 8270E LVI	
2-Methylnaphthalene	ND	0.0363	0.0726	ug/L	1	04/03/23 19:13	EPA 8270E LVI	
Naphthalene	ND	0.0363	0.0726	ug/L	1	04/03/23 19:13	EPA 8270E LVI	
Phenanthrene	ND	0.0363	0.0726	ug/L	1	04/03/23 19:13	EPA 8270E LVI	
Pyrene	**0.0313**	0.0182	0.0363	ug/L	1	04/03/23 19:13	EPA 8270E LVI	**J**
Surrogate: Acenaphthylene-d8 (Surr)		*Recovery:*	*128 %*	*Limits:* *78-134 %*	*1*	*04/03/23 19:13*	*EPA 8270E LVI*	*Q-41*
Benzo(a)pyrene-d12 (Surr)			*127 %*	*80-132 %*	*1*	*04/03/23 19:13*	*EPA 8270E LVI*	

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ORELAP ID: OR100062

ANALYTICAL REPORT

Geosyntec Consultants, Inc	Project: POP - T4 Stormwater	
920 SW Sixth Avenue, Suite 600	Project Number: PNW0319AR	Report ID:
Portland, OR 97204	Project Manager: Ariel Mosbrucker	A3D0709 - 04 18 23 1649

ANALYTICAL SAMPLE RESULTS

Solid and Moisture Determinations

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
STSMH2710 (A3D0709-01)				**Matrix: Water**				
Batch: 23D0068								
Total Suspended Solids	**37.0**	---	5.00	mg/L	1	04/03/23 17:22	SM 2540 D	
STSMH2603 (A3D0709-02)				**Matrix: Water**				
Batch: 23D0068								
Total Suspended Solids	**39.0**	---	5.00	mg/L	1	04/03/23 17:22	SM 2540 D	
STSMH2615 (A3D0709-03)				**Matrix: Water**				
Batch: 23D0068								
Total Suspended Solids	**34.0**	---	5.00	mg/L	1	04/03/23 17:22	SM 2540 D	
STSMH2712 (A3D0709-04)				**Matrix: Water**				
Batch: 23D0136								
Total Suspended Solids	**13.0**	---	5.00	mg/L	1	04/05/23 10:52	SM 2540 D	**EST_s**
STSMH1914 (A3D0709-05)				**Matrix: Water**				
Batch: 23D0136								
Total Suspended Solids	**109**	---	5.00	mg/L	1	04/05/23 10:52	SM 2540 D	

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Darrell Auvil, Client Services Manager

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Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0319AR**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A3D0709 - 04 18 23 1649**

QUALITY CONTROL (QC) SAMPLE RESULTS

Polychlorinated Biphenyls by EPA 8082A

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23D0533 - EPA 3510C (Neutral pH)							**Water**					
Blank (23D0533-BLK1)			Prepared: 04/13/23 12:06		Analyzed: 04/14/23 08:47							**C-07**
EPA 8082A												
Aroclor 1016	ND	0.0100	0.0200	ug/L	1	---	---	---	---	---	---	
Aroclor 1221	ND	0.0100	0.0200	ug/L	1	---	---	---	---	---	---	
Aroclor 1232	ND	0.0100	0.0200	ug/L	1	---	---	---	---	---	---	
Aroclor 1242	ND	0.0100	0.0200	ug/L	1	---	---	---	---	---	---	
Aroclor 1248	ND	0.0100	0.0200	ug/L	1	---	---	---	---	---	---	
Aroclor 1254	ND	0.0100	0.0200	ug/L	1	---	---	---	---	---	---	
Aroclor 1260	ND	0.0100	0.0200	ug/L	1	---	---	---	---	---	---	
Aroclor 1262	ND	0.0100	0.0200	ug/L	1	---	---	---	---	---	---	
Aroclor 1268	ND	0.0100	0.0200	ug/L	1	---	---	---	---	---	---	
Surr: Decachlorobiphenyl (Surr)			*Recovery: 75 %*		*Limits: 40-135 %*			*Dilution: 1x*				
LCS (23D0533-BS1)			Prepared: 04/13/23 12:06		Analyzed: 04/14/23 09:05							**C-07**
EPA 8082A												
Aroclor 1016	0.674	0.0100	0.0200	ug/L	1	1.25	---	54	46-129%	---	---	
Aroclor 1260	0.936	0.0100	0.0200	ug/L	1	1.25	---	75	45-134%	---	---	
Surr: Decachlorobiphenyl (Surr)			*Recovery: 70 %*		*Limits: 40-135 %*			*Dilution: 1x*				
LCS Dup (23D0533-BSD1)			Prepared: 04/13/23 12:06		Analyzed: 04/14/23 09:22							**C-07, Q-19**
EPA 8082A												
Aroclor 1016	0.660	0.0100	0.0200	ug/L	1	1.25	---	53	46-129%	2	30%	
Aroclor 1260	0.977	0.0100	0.0200	ug/L	1	1.25	---	78	45-134%	4	30%	
Surr: Decachlorobiphenyl (Surr)			*Recovery: 77 %*		*Limits: 40-135 %*			*Dilution: 1x*				

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920 SW Sixth Avenue, Suite 600	Project Number: **PNW0319AR**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A3D0709 - 04 18 23 1649**

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23D0030 - EPA 3511 (Bottle Extraction)							**Water**					
Blank (23D0030-BLK1)			Prepared: 04/03/23 09:55 Analyzed: 04/03/23 13:44									
EPA 8270E LVI												
Acenaphthene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Acenaphthylene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Anthracene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Benz(a)anthracene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Benzo(a)pyrene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Benzo(b)fluoranthene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Benzo(k)fluoranthene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Benzo(g,h,i)perylene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Chrysene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Dibenz(a,h)anthracene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Fluoranthene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Fluorene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Indeno(1,2,3-cd)pyrene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
1-Methylnaphthalene	ND	0.0320	0.0640	ug/L	1	---	---	---	---	---	---	
2-Methylnaphthalene	ND	0.0320	0.0640	ug/L	1	---	---	---	---	---	---	
Naphthalene	ND	0.0320	0.0640	ug/L	1	---	---	---	---	---	---	
Phenanthrene	ND	0.0320	0.0640	ug/L	1	---	---	---	---	---	---	
Pyrene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Carbazole	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Dibenzofuran	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Surr: Acenaphthylene-d8 (Surr)			*Recovery: 125 %*		*Limits: 78-134 %*				*Dilution: 1x*			Q-41
Benzo(a)pyrene-d12 (Surr)			*122 %*		*80-132 %*				*"*			
LCS (23D0030-BS1)			Prepared: 04/03/23 09:55 Analyzed: 04/03/23 14:17									
EPA 8270E LVI												
Acenaphthene	1.51	0.0160	0.0320	ug/L	1	1.60	---	95	80-120%	---	---	
Acenaphthylene	1.78	0.0160	0.0320	ug/L	1	1.60	---	111	80-124%	---	---	
Anthracene	1.71	0.0160	0.0320	ug/L	1	1.60	---	107	80-123%	---	---	
Benz(a)anthracene	1.78	0.00800	0.0160	ug/L	1	1.60	---	111	80-122%	---	---	
Benzo(a)pyrene	2.00	0.00800	0.0160	ug/L	1	1.60	---	125	80-129%	---	---	
Benzo(b)fluoranthene	1.85	0.00800	0.0160	ug/L	1	1.60	---	116	80-124%	---	---	
Benzo(k)fluoranthene	1.91	0.00800	0.0160	ug/L	1	1.60	---	120	80-125%	---	---	
Benzo(g,h,i)perylene	1.61	0.0160	0.0320	ug/L	1	1.60	---	101	80-120%	---	---	

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920 SW Sixth Avenue, Suite 600	Project Number: **PNW0319AR**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A3D0709 - 04 18 23 1649**

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23D0030 - EPA 3511 (Bottle Extraction)							**Water**					
LCS (23D0030-BS1)			Prepared: 04/03/23 09:55		Analyzed: 04/03/23 14:17							
Chrysene	1.65	0.00800	0.0160	ug/L	1	1.60	---	103	80-120%	---	---	
Dibenz(a,h)anthracene	1.58	0.00800	0.0160	ug/L	1	1.60	---	99	80-120%	---	---	
Fluoranthene	1.72	0.0160	0.0320	ug/L	1	1.60	---	108	80-126%	---	---	
Fluorene	1.59	0.0160	0.0320	ug/L	1	1.60	---	100	77-127%	---	---	
Indeno(1,2,3-cd)pyrene	1.53	0.00800	0.0160	ug/L	1	1.60	---	95	80-121%	---	---	
1-Methylnaphthalene	1.40	0.0320	0.0640	ug/L	1	1.60	---	87	53-148%	---	---	
2-Methylnaphthalene	1.37	0.0320	0.0640	ug/L	1	1.60	---	86	48-150%	---	---	
Naphthalene	1.58	0.0320	0.0640	ug/L	1	1.60	---	99	78-120%	---	---	
Phenanthrene	1.54	0.0320	0.0640	ug/L	1	1.60	---	96	80-120%	---	---	
Pyrene	1.71	0.0160	0.0320	ug/L	1	1.60	---	107	80-125%	---	---	
Carbazole	1.98	0.0160	0.0320	ug/L	1	1.60	---	124	65-141%	---	---	
Dibenzofuran	1.63	0.0160	0.0320	ug/L	1	1.60	---	102	76-121%	---	---	
Surr: Acenaphthylene-d8 (Surr)			*Recovery: 125 %*		*Limits: 78-134 %*				*Dilution: 1x*			Q-41
Benzo(a)pyrene-d12 (Surr)			*126 %*		*80-132 %*				*"*			
LCS Dup (23D0030-BSD1)			Prepared: 04/03/23 09:55		Analyzed: 04/03/23 14:50							**Q-19**
EPA 8270E LVI												
Acenaphthene	1.60	0.0160	0.0320	ug/L	1	1.60	---	100	80-120%	5	30%	
Acenaphthylene	1.84	0.0160	0.0320	ug/L	1	1.60	---	115	80-124%	3	30%	
Anthracene	1.72	0.0160	0.0320	ug/L	1	1.60	---	108	80-123%	0.9	30%	
Benz(a)anthracene	1.84	0.00800	0.0160	ug/L	1	1.60	---	115	80-122%	3	30%	
Benzo(a)pyrene	2.02	0.00800	0.0160	ug/L	1	1.60	---	126	80-129%	0.7	30%	
Benzo(b)fluoranthene	1.86	0.00800	0.0160	ug/L	1	1.60	---	117	80-124%	0.6	30%	
Benzo(k)fluoranthene	1.96	0.00800	0.0160	ug/L	1	1.60	---	122	80-125%	2	30%	
Benzo(g,h,i)perylene	1.66	0.0160	0.0320	ug/L	1	1.60	---	104	80-120%	3	30%	
Chrysene	1.72	0.00800	0.0160	ug/L	1	1.60	---	107	80-120%	4	30%	
Dibenz(a,h)anthracene	1.58	0.00800	0.0160	ug/L	1	1.60	---	99	80-120%	0.03	30%	
Fluoranthene	1.76	0.0160	0.0320	ug/L	1	1.60	---	110	80-126%	2	30%	
Fluorene	1.67	0.0160	0.0320	ug/L	1	1.60	---	104	77-127%	5	30%	
Indeno(1,2,3-cd)pyrene	1.57	0.00800	0.0160	ug/L	1	1.60	---	98	80-121%	3	30%	
1-Methylnaphthalene	1.52	0.0320	0.0640	ug/L	1	1.60	---	95	53-148%	8	30%	
2-Methylnaphthalene	1.48	0.0320	0.0640	ug/L	1	1.60	---	92	48-150%	7	30%	
Naphthalene	1.61	0.0320	0.0640	ug/L	1	1.60	---	101	78-120%	2	30%	
Phenanthrene	1.60	0.0320	0.0640	ug/L	1	1.60	---	100	80-120%	3	30%	

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Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0319AR**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A3D0709 - 04 18 23 1649**

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23D0030 - EPA 3511 (Bottle Extraction)							**Water**					
LCS Dup (23D0030-BSD1)			Prepared: 04/03/23 09:55		Analyzed: 04/03/23 14:50							**Q-19**
Pyrene	1.73	0.0160	0.0320	ug/L	1	1.60	---	108	80-125%	1	30%	
Carbazole	1.98	0.0160	0.0320	ug/L	1	1.60	---	124	65-141%	0.1	30%	
Dibenzofuran	1.72	0.0160	0.0320	ug/L	1	1.60	---	107	76-121%	5	30%	
Surr: Acenaphthylene-d8 (Surr)			*Recovery: 126 %*		*Limits: 78-134 %*				*Dilution: 1x*			Q-41
Benzo(a)pyrene-d12 (Surr)			*125 %*		*80-132 %*				*"*			

Apex Laboratories

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Darrell Auvil, Client Services Manager

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

ANALYTICAL REPORT

Geosyntec Consultants, Inc	Project:	POP - T4 Stormwater
920 SW Sixth Avenue, Suite 600	Project Number:	PNW0319AR
Portland, OR 97204	Project Manager:	Ariel Mosbrucker

Report ID:
A3D0709 - 04 18 23 1649

QUALITY CONTROL (QC) SAMPLE RESULTS

Solid and Moisture Determinations

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23D0068 - Total Suspended Solids - 2022								Water				
Blank (23D0068-BLK1)			Prepared: 04/03/23 17:22		Analyzed: 04/03/23 17:22							
SM 2540 D												
Total Suspended Solids	ND	---	5.00	mg/L	1	---	---	---	---	---	---	
Duplicate (23D0068-DUP1)			Prepared: 04/03/23 17:22		Analyzed: 04/03/23 17:22							
QC Source Sample: Non-SDG (A3D0715-01)												
Total Suspended Solids	ND	---	5.00	mg/L	1	---	ND	---	---	---	10%	EST_s
Duplicate (23D0068-DUP2)			Prepared: 04/03/23 17:22		Analyzed: 04/03/23 17:22							
QC Source Sample: Non-SDG (A3D0715-03)												
Total Suspended Solids	**237**	---	5.00	mg/L	1	---	236	---	---	0.423	10%	
Reference (23D0068-SRM1)			Prepared: 04/03/23 17:22		Analyzed: 04/03/23 17:22							
SM 2540 D												
Total Suspended Solids	963	---		mg/L	1	926		104	85-116%	---	---	

Apex Laboratories

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Darrell Auvil, Client Services Manager

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0319AR**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A3D0709 - 04 18 23 1649**

QUALITY CONTROL (QC) SAMPLE RESULTS

Solid and Moisture Determinations

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23D0136 - Total Suspended Solids - 2022												**Water**
Blank (23D0136-BLK1)			Prepared: 04/05/23 10:52		Analyzed: 04/05/23 10:52							
SM 2540 D												
Total Suspended Solids	ND	---	5.00	mg/L	1	---	---	---	---	---	---	
Duplicate (23D0136-DUP1)			Prepared: 04/05/23 10:52		Analyzed: 04/05/23 10:52							
QC Source Sample: Non-SDG (A3C1157-01)												
Total Suspended Solids	ND	---	5.00	mg/L	1	---	ND	---	---	---	10%	EST_s
Duplicate (23D0136-DUP2)			Prepared: 04/05/23 10:52		Analyzed: 04/05/23 10:52							
QC Source Sample: Non-SDG (A3D0721-01)												
Total Suspended Solids	**5.00**	---	5.00	mg/L	1	---	5.00	---	---	0.00	10%	EST_s
Reference (23D0136-SRM1)			Prepared: 04/05/23 10:52		Analyzed: 04/05/23 10:52							
SM 2540 D												
Total Suspended Solids	920	---		mg/L	1	926		99.4	85-116%	---	---	

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Darrell Auvil, Client Services Manager

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

ANALYTICAL REPORT

Geosyntec Consultants, Inc	Project: POP - T4 Stormwater	
920 SW Sixth Avenue, Suite 600	Project Number: PNW0319AR	Report ID:
Portland, OR 97204	Project Manager: Ariel Mosbrucker	A3D0709 - 04 18 23 1649

SAMPLE PREPARATION INFORMATION

Polychlorinated Biphenyls by EPA 8082A

Prep: EPA 3510C (Neutral pH)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 23D0533							
A3D0709-05	Water	EPA 8082A	04/01/23 07:30	04/13/23 12:06	1060mL/1mL	1000mL/1mL	0.94

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Prep: EPA 3511 (Bottle Extraction)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 23D0030							
A3D0709-04	Water	EPA 8270E LVI	04/01/23 07:30	04/03/23 09:55	110.14mL/5mL	125mL/5mL	1.13

Solid and Moisture Determinations

Prep: Total Suspended Solids - 2022

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 23D0068							
A3D0709-01	Water	SM 2540 D	03/31/23 19:37	04/03/23 17:22			NA
A3D0709-02	Water	SM 2540 D	03/31/23 19:40	04/03/23 17:22			NA
A3D0709-03	Water	SM 2540 D	03/31/23 19:46	04/03/23 17:22			NA
Batch: 23D0136							
A3D0709-04	Water	SM 2540 D	04/01/23 07:30	04/05/23 10:52			NA
A3D0709-05	Water	SM 2540 D	04/01/23 07:30	04/05/23 10:52			NA

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503-718-2323
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ANALYTICAL REPORT

Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0319AR**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A3D0709 - 04 18 23 1649**

QUALIFIER DEFINITIONS

Client Sample and Quality Control (QC) Sample Qualifier Definitions:

Apex Laboratories

C-07	Extract has undergone Sulfuric Acid Cleanup by EPA 3665A, Sulfur Cleanup by EPA 3660B, and Florisil Cleanup by EPA 3620B in order to minimize matrix interference.
EST_s	Solids results are reported as estimates when less than 2.5 mg residue is recovered during analysis. All method QC requirements have been met for samples, and reporting levels are adjusted based on volume filtered. Results meet regulatory requirements.
J	Estimated Result. Result detected below the lowest point of the calibration curve, but above the specified MDL.
M-05	Estimated results. Peak separation for structural isomers is insufficient for accurate quantification.
Q-19	Blank Spike Duplicate (BSD) sample analyzed in place of Matrix Spike/Duplicate samples due to limited sample amount available for analysis.
Q-41	Estimated Results. Recovery of Continuing Calibration Verification sample above upper control limit for this analyte. Results are likely biased high.

Apex Laboratories

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ANALYTICAL REPORT

Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0319AR**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A3D0709 - 04 18 23 1649**

REPORTING NOTES AND CONVENTIONS:

Abbreviations:

DET Analyte DETECTED at or above the detection or reporting limit.

ND Analyte NOT DETECTED at or above the detection or reporting limit.

NR Result Not Reported

RPD Relative Percent Difference. RPDs for Matrix Spikes and Matrix Spike Duplicates are based on concentration, not recovery.

Detection Limits: Limit of Detection (LOD)

Limits of Detection (LODs) are normally set at a level of one half the validated Limit of Quantitation (LOQ).
If no value is listed ('-----'), then the data has not been evaluated below the Reporting Limit.

Reporting Limits: Limit of Quantitation (LOQ)

Validated Limits of Quantitation (LOQs) are reported as the Reporting Limits for all analyses where the LOQ, MRL, PQL or CRL are requested. The LOQ represents a level at or above the low point of the calibration curve, that has been validated according to Apex Laboratories' comprehensive LOQ policies and procedures.

Reporting Conventions:

Basis: Results for soil samples are generally reported on a 100% dry weight basis.
The Result Basis is listed following the units as " dry", " wet", or " " (blank) designation.

" dry" Sample results and Reporting Limits are reported on a dry weight basis. (i.e. "ug/kg dry")
See Percent Solids section for details of dry weight analysis.

" wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected, but have not been modified in this case.

" " Results without 'wet' or 'dry' designation are not normally dry weight corrected. These results are considered 'As Received'.

QC Source:

In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) may be analyzed to demonstrate accuracy and precision of the extraction batch.

Non-Client Batch QC Samples (Duplicates and Matrix Spike/Duplicates) may not be included in this report. Please request a Full QC report if this data is required.

Miscellaneous Notes:

" --- " QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

" *** " Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to ½ the Reporting Limit (RL).
-For Blank hits falling between ½ the RL and the RL (J flagged hits), the associated sample and QC data will receive a 'B-02' qualifier.
-For Blank hits above the RL, the associated sample and QC data will receive a 'B' qualifier, per Apex Laboratories' Blank Policy.
For further details, please request a copy of this document.

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Darrell Auvil, Client Services Manager

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Apex Laboratories, LLC
6700 S.W. Sandburg Street
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503-718-2323
ORELAP ID: **OR100062**

Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0319AR**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A3D0709 - 04 18 23 1649**

REPORTING NOTES AND CONVENTIONS (Cont.):

Blanks (Cont.):

Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the sample results are less than ten times the level found in the blank for inorganic analyses, or less than five times the level found in the blank for organic analyses.

'B' and 'B-02' qualifications are only applied to sample results detected above the Reporting Level.

Preparation Notes:

Mixed Matrix Samples:

Water Samples:

Water samples containing significant amounts of sediment are decanted or separated prior to extraction, and only the water portion analyzed, unless otherwise directed by the client.

Soil and Sediment Samples:

Soil and Sediment samples containing significant amounts of water are decanted prior to extraction, and only the solid portion analyzed, unless otherwise directed by the client.

Sampling and Preservation Notes:

Certain regulatory programs, such as National Pollutant Discharge Elimination System (NPDES), require that activities such as sample filtration (for dissolved metals, orthophosphate, hexavalent chromium, etc.) and testing of short hold analytes (pH, Dissolved Oxygen, etc.) be performed in the field (on-site) within a short time window. In addition, sample matrix spikes are required for some analyses, and sufficient volume must be provided, and billable site specific QC requested, if this is required. All regulatory permits should be reviewed to ensure that these requirements are being met.

Data users should be aware of which regulations pertain to the samples they submit for testing. If related sample collection activities are not approved for a particular regulatory program, results should be considered estimates. Apex Laboratories will qualify these analytes according to the most stringent requirements, however results for samples that are for non-regulatory purposes may be acceptable.

Samples that have been filtered and preserved at Apex Laboratories per client request are listed in the preparation section of the report with the date and time of filtration listed.

Apex Laboratories maintains detailed records on sample receipt, including client label verification, cooler temperature, sample preservation, hold time compliance and field filtration. Data is qualified as necessary, and the lack of qualification indicates compliance with required parameters.

Apex Laboratories

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ANALYTICAL REPORT

Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0319AR**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A3D0709 - 04 18 23 1649**

LABORATORY ACCREDITATION INFORMATION

ORELAP Certification ID: OR100062 (Primary Accreditation) - EPA ID: OR01039

All methods and analytes reported from work performed at Apex Laboratories are included on Apex Laboratories' ORELAP Scope of Certification, with the exception of any analyte(s) listed below:

Apex Laboratories

Matrix	Analysis	TNI_ID	Analyte	TNI_ID	Accreditation

All reported analytes are included in Apex Laboratories' current ORELAP scope.

Secondary Accreditations

Apex Laboratories also maintains reciprocal accreditation with non-TNI states (Washington DOE), as well as other state specific accreditations not listed here.

Subcontract Laboratory Accreditations

Subcontracted data falls outside of Apex Laboratories' Scope of Accreditation.
Please see the Subcontract Laboratory report for full details, or contact your Project Manager for more information.

Field Testing Parameters

Results for Field Tested data are provded by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

Apex Laboratories

Darrell Auvil, Client Services Manager

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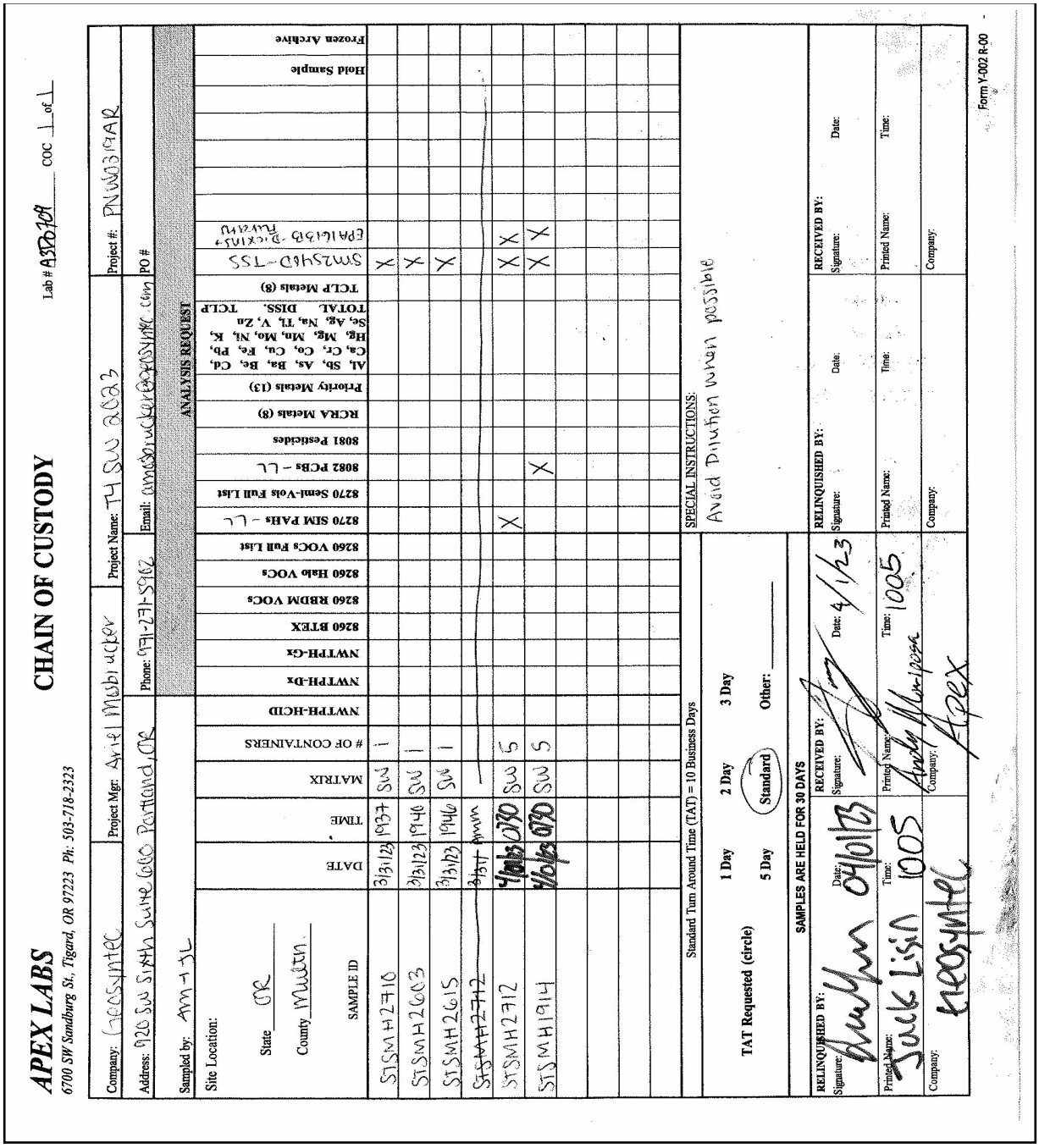
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0319AR**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A3D0709 - 04 18 23 1649**



CHAIN OF CUSTODY

APEX LABS
6700 SW Sandburg St., Tigard, OR 97223 Ph: 503-718-2323

Lab # A3D0709 COC 1 of 1

Company: Geosyntec | Project Mgr: Ariel Mosbrucker | Project Name: T4 SW 2023 | Project #: PNW0319AR
Address: 920 SW Sixth Suite 600 Portland, OR | Phone: 971-271-5962 | Email: amosbrucker@geosyntec.com | PO #
Sampled by: AM-TL
Site Location: State OR County Multn.

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	# OF CONTAINERS	NWTPH-HCID	NWTPH-Dx	NWTPH-Gx	8260 BTEX	8260 RBDM VOCs	8260 Halo VOCs	8260 VOCs Full List	8270 SIM PAHs - LL	8270 Semi-Vols Full List	8082 PCBs - LL	8081 Pesticides	RCRA Metals (8)	Priority Metals (13)	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Hg, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Tl, V, Zn TOTAL DISS. TCLP	TCLP Metals (8)	SM2540D-TSS	EPA1630 - Fluoride	Hold Sample	Frozen Archive
SISMH2710	3/31/23	1937	SW	1															X			
SISMH2603	3/31/23	1940	SW	1															X			
SISMH2615	3/31/23	1946	SW	1															X			
SISMH2712	3/31/23	Amm																				
SISMH2712	3/31/23	0920	SW	5								X							X	X		
SISMH1914	3/31/23	0920	SW	5										X					X	X		

Standard Turn Around Time (TAT) = 10 Business Days
TAT Requested (circle): 1 Day | 2 Day | 3 Day | 5 Day | Standard | Other: _____

SPECIAL INSTRUCTIONS: Avoid Dilution when possible

SAMPLES ARE HELD FOR 30 DAYS

RELINQUISHED BY: Signature: Date: Time: Printed Name: Company:
RECEIVED BY: Signature: Date: 04/01/23 Time: 1005 Printed Name: Andy Mosbrucker Company: Apex
RELINQUISHED BY: Signature: Date: 4/1/23 Time: 1005 Printed Name: Jacke Lisin Company: Geosyntec
RECEIVED BY: Signature: Date: Time: Printed Name: Company:

Form Y-002 R-00

Apex Laboratories

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Darrell Auvil, Client Services Manager

APEX LABORATORIES

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0319AR**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A3D0709 - 04 18 23 1649**

APEX LABS COOLER RECEIPT FORM

Client: Geosyntec Element WO#: A3D0709

Project/Project #: T4 SW 2023 / PNW0319AR

Delivery Info:

Date/time received: 4/1/23 @ 1005 By: AJM

Delivered by: Apex__Client_✓_ESS__FedEx__UPS__Radio__Morgan__SDS__Evergreen__Other__

Cooler Inspection Date/time inspected: 4/1/23 @ 1006 By: AJM

Chain of Custody included? Yes ✓ No ____

Signed/dated by client? Yes ✓ No ____

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (°C)	2.3						
Custody seals? (Y/N)	N						
Received on ice? (Y/N)	Y						
Temp. blanks? (Y/N)	Y						
Ice type: (Gel/Real/Other)	Real						
Condition (In/Out):	In						

Cooler out of temp? (Y/N) Possible reason why: ____

Green dots applied to out of temperature samples? Yes/No

Out of temperature samples form initiated? Yes/No

Sample Inspection: Date/time inspected: ~~A3C~~ 4.1.23 @ 10:18 By: KAM

All samples intact? Yes ✓ No ___ Comments: 2 analytes

Bottle labels/COCs agree? Yes ✓ No ___ Comments: ____

COC/container discrepancies form initiated? Yes ___ No ✓

Containers/volumes received appropriate for analysis? Yes ✓ No ___ Comments: ____

Do VOA vials have visible headspace? Yes ___ No ___ NA ✓

Comments ____

Water samples: pH checked: Yes___No___NA ✓ pH appropriate? Yes___No___NA ✓

Comments: ____

Additional information: ____

Labeled by: KAM Witness: AJM Cooler Inspected by: KAM

Form Y-003 R-00 -

Apex Laboratories

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Darrell Auvil, Client Services Manager

CERES Analytical Laboratory, Inc.
4919 Windplay Dr. Suite 1, El Dorado Hills, CA 95762

April 14, 2023 Ceres ID: 16230

Apex Laboratories
6700 S.W. Sandburg Street
Tigard, OR 97223

The following report contains the results for the two aqueous samples received on April 4, 2023. These samples were analyzed for tetra through octa chlorinated dioxins and dibenzofurans by EPA method 1613. Standard 2-week turn-around time was provided for this work.

This work was authorized under Apex Laboratories' Project # A3D0709.

Continuing Calibration Verification (CCV) Requirements
All associated calibration verification standard(s) (CCV) met the acceptance criteria.

The report consists of a Cover Letter, Sample Inventory (Section I), Data Summary (Section II), Sample Tracking (Section VI), and Qualifiers/Abbreviations (Section VII). Raw Data (Section III), Continuing Calibration (Section IV), and Initial Calibration (Section V) are available in a full report (.pdf format) upon request.

If you have any questions regarding this report, please feel free to contact me at (916)932-5011.

Sincerely,

James M. Hedin
Director of Operations/CEO
jhedin@ceres-lab.com

Section I: Sample Inventory

Ceres Sample ID:	Sample ID	Date Received	Collection Date	&Time
16230-001	STSMH2712 (A3D0709-04)	4/4/2023	4/1/2023	7:30
16230-002	STSMH1914 (A3D0709-05)	4/4/2023	4/1/2023	7:30

Section II: Data Summary

CERES Analytical Laboratory, Inc.
4919 Windplay Dr. Suite 1, El Dorado Hills, CA 95762

EPA Method 1613B

Quality Assurance Sample **Method Blank**	**QC Batch #:** 2844 **Matrix:** Aqueous	**Date Received:** NA **Date Extracted:** 4/11/2023
Project ID: A3D0709	**Sample Size:** 1.000 L	**Date Analyzed:** 4/12/2023

Analyte	Conc. (pg/L)	MDL	RL	Qual.	Labeled Standards	% R	LCL-UCL (a)	Qualifiers
2,3,7,8-TCDD	DL= 3.85	0.887	5.00		13C-2378-TCDD	81.0	25-164	
12378-PeCDD	DL= 14.8	2.56	25.0		13C-12378-PeCDD	89.3	25-181	
123478-HxCDD	DL= 13.7	3.08	25.0		13C-123478-HxCDD	88.3	32-141	
123678-HxCDD	DL= 12.9	5.29	25.0		13C-123678-HxCDD	97.1	28-130	
123789-HxCDD	DL= 12.8	13.1	25.0		13C-1234678-HpCDD	68.0	23-140	
1234678-HpCDD	DL= 9.16	5.15	25.0		13C-OCDD	71.6	17-157	
OCDD	DL= 18.4	8.50	50.0		13C-2378-TCDF	74.6	24-169	
2,3,7,8-TCDF	DL= 2.73	0.733	5.00		13C-12378-PeCDF	961	24-185	
12378-PeCDF	DL= 4.81	2.96	25.0		13C-23478-PeCDF	89.0	21-178	
23478-PeCDF	DL= 4.81	5.40	25.0		13C-123478-HxCDF	96.8	26-152	
123478-HxCDF	DL= 7.44	3.93	25.0		13C-123678-HxCDF	101	26-123	
123678-HxCDF	DL= 7.89	2.94	25.0		13C-234678-HxCDF	99.9	28-136	
234678-HxCDF	DL= 9.46	4.32	25.0		13C-123789-HxCDF	105	29-147	
123789-HxCDF	DL= 11.0	4.70	25.0		13C-1234678-HpCDF	79.7	28-143	
1234678-HpCDF	DL= 12.9	4.24	25.0		13C-1234789-HpCDF	92.1	26-138	
1234789-HpCDF	DL= 13.2	5.74	25.0					
OCDF	DL= 15.4	11.7	50.0					

Totals	Conc. (pg/L)	EMPC
Total TCDD	DL= 3.85	
Total PeCDD	DL= 14.8	
Total HxCDD	DL= 13.7	
Total HpCDD	DL= 9.16	
Total TCDF	DL= 2.73	
Total PeCDF	DL= 4.81	
Total HxCDF	DL= 11.0	
Total HpCDF	DL= 13.2	

CRS

37Cl4-2378-TCDD	128	35-197	

DL - Signifies Non-Detect (ND<) sample specific detection limit.
EMPC - Estimated Maximum Possible Concentration due to ion abundance ratio failure.
(a) - Lower control limit - Upper control limit
(b) - TEQ based on (2005) World Health Organization (WHO) Toxic Equivalent Factors.

Total Toxic Equivalency (TEQ min.) (b)**:** 0.0 pg/L

Analyst: JMH **Reviewed by: BS**

CERES Analytical Laboratory, Inc.
4919 Windplay Dr. Suite 1, El Dorado Hills, CA 95762

EPA Method 1613B

Quality Assurance Sample **Ongoing Precision and Recovery**		**Date Received:** NA
	QC Batch #: 2844	**Date Extracted:** 4/11/2023
	Matrix: Aqueous	**Date Analyzed:** 4/12/2023
Project ID: A3D0709	**Sample Size:** 1.000 L	

Analyte	Conc. (ng/mL)	Limits (a)
2,3,7,8-TCDD	9.89	6.7-15.8
12378-PeCDD	58.8	35-71
123478-HxCDD	57.2	35-82
123678-HxCDD	45.3	38-67
123789-HxCDD	49.0	32-81
1234678-HpCDD	58.8	35-70
OCDD	110	78-144
2,3,7,8-TCDF	10.6	7.5-15.8
12378-PeCDF	57.8	40-67
23478-PeCDF	59.5	34-80
123478-HxCDF	50.6	36-67
123678-HxCDF	50.2	42-65
234678-HxCDF	50.7	35-78
123789-HxCDF	49.3	39-65
1234678-HpCDF	59.1	41-61
1234789-HpCDF	58.9	39-69
OCDF	123	63-170

Labeled Standards	% Rec.	Limits (a)
13C-2378-TCDD	84.6	20-175
13C-12378-PeCDD	95.3	21-227
13C-123478-HxCDD	86.8	21-193
13C-123678-HxCDD	85.6	25-163
13C-1234678-HpCDD	68.1	26-166
13C-OCDD	73.9	13-198
13C-2378-TCDF	75.0	22-152
13C-12378-PeCDF	102	21-192
13C-23478-PeCDF	96.2	13-328
13C-123478-HxCDF	85.9	19-202
13C-123678-HxCDF	93.1	21-159
13C-234678-HxCDF	95.1	22-176
13C-123789-HxCDF	105	17-205
13C-1234678-HpCDF	76.4	21-158
13C-1234789-HpCDF	86.8	20-186
CRS		
37Cl4-2378-TCDD	128	31-191

(a) Limits based on method acceptance criteria.

Analyst: JMH **Reviewed by: BS**

CERES Analytical Laboratory, Inc.
4919 Windplay Dr. Suite 1, El Dorado Hills, CA 95762

EPA Method 1613B

Client Sample ID: STSMH2712 (A3D0709-04)		
Project ID: A3D0709	**Ceres Sample ID:** 16230-001	**Date Received:** 4/4/2023
	QC Batch #: 2844	**Date Extracted:** 4/11/2023
Date Collected: 4/1/2023	**Matrix:** Aqueous	**Date Analyzed:** 4/13/2023
Time Collected: 7:30	**Sample Size:** 1.014 L	

Analyte	Conc. (pg/L)	MDL	RL	Qual.
2,3,7,8-TCDD	DL= 3.00	0.887	4.93	
12378-PeCDD	DL= 6.41	2.56	24.7	
123478-HxCDD	DL= 10.6	3.08	24.7	
123678-HxCDD	DL= 9.38	5.29	24.7	
123789-HxCDD	DL= 9.24	13.1	24.7	
1234678-HpCDD	183	5.15	24.7	
OCDD	1,210	8.50	49.3	
2,3,7,8-TCDF	DL= 2.97	0.733	4.93	
12378-PeCDF	DL= 3.90	2.96	24.7	
23478-PeCDF	DL= 3.52	5.40	24.7	
123478-HxCDF	DL= 6.35	3.93	24.7	
123678-HxCDF	DL= 6.59	2.94	24.7	
234678-HxCDF	DL= 8.32	4.32	24.7	
123789-HxCDF	DL= 9.73	4.70	24.7	
1234678-HpCDF	DL= 6.34	4.24	24.7	
1234789-HpCDF	DL= 6.22	5.74	24.7	
OCDF	DL= 13.6	11.7	49.3	

Totals	Conc. (pg/L)	EMPC
Total TCDD	DL= 3.00	
Total PeCDD	DL= 6.41	
Total HxCDD	DL= 10.6	
Total HpCDD	463	
Total TCDF	DL= 2.97	
Total PeCDF	DL= 3.90	
Total HxCDF	DL= 9.73	
Total HpCDF	DL= 6.34	

Labeled Standards	% R	LCL-UCL (a)	Qualifiers
13C-2378-TCDD	82.9	25-164	
13C-12378-PeCDD	89.5	25-181	
13C-123478-HxCDD	76.7	32-141	
13C-123678-HxCDD	89.1	28-130	
13C-1234678-HpCDD	52.2	23-140	
13C-OCDD	44.3	17-157	
13C-2378-TCDF	72.5	24-169	
13C-12378-PeCDF	96.5	24-185	
13C-23478-PeCDF	89.1	21-178	
13C-123478-HxCDF	95.5	26-152	
13C-123678-HxCDF	98.7	26-123	
13C-234678-HxCDF	96.4	28-136	
13C-123789-HxCDF	98.6	29-147	
13C-1234678-HpCDF	60.6	28-143	
13C-1234789-HpCDF	70.4	26-138	

CRS

37Cl4-2378-TCDD	126	35-197

DL - Signifies Non-Detect (ND<) sample specific detection limit.
EMPC - Estimated Maximum Possible Concentration due to ion abundance ratio failure.
(a) - Lower control limit - Upper control limit
(b) - TEQ based on (2005) World Health Organization (WHO) Toxic Equivalent Factors.

Total Toxic Equivalency (TEQ min.) (b)**:** 2.19 pg/L

Analyst: JMH **Reviewed by: BS**

CERES Analytical Laboratory, Inc.
4919 Windplay Dr. Suite 1, El Dorado Hills, CA 95762

EPA Method 1613B

Client Sample ID: STSMH1914 (A3D0709-05)

Project ID: A3D0709	**Ceres Sample ID:** 16230-002	**Date Received:** 4/4/2023
	QC Batch #: 2844	**Date Extracted:** 4/11/2023
Date Collected: 4/1/2023	**Matrix:** Aqueous	**Date Analyzed:** 4/13/2023
Time Collected: 7:30	**Sample Size:** 1.023 L	

Analyte	Conc. (pg/L)	MDL	RL	Qual.	Labeled Standards	% R	LCL-UCL (a)	Qualifiers
2,3,7,8-TCDD	DL= 1.70	0.887	4.89		13C-2378-TCDD	87.9	25-164	
12378-PeCDD	DL= 4.63	2.56	24.4		13C-12378-PeCDD	92.5	25-181	
123478-HxCDD	DL= 8.28	3.08	24.4		13C-123478-HxCDD	86.1	32-141	
123678-HxCDD	DL= 7.22	5.29	24.4		13C-123678-HxCDD	99.2	28-130	
123789-HxCDD	DL= 7.11	13.1	24.4		13C-1234678-HpCDD	60.4	23-140	
1234678-HpCDD	132	5.15	24.4		13C-OCDD	53.5	17-157	
OCDD	699	8.50	48.9		13C-2378-TCDF	76.7	24-169	
2,3,7,8-TCDF	DL= 2.05	0.733	4.89		13C-12378-PeCDF	97.4	24-185	
12378-PeCDF	DL= 2.64	2.96	24.4		13C-23478-PeCDF	90.5	21-178	
23478-PeCDF	DL= 2.59	5.40	24.4		13C-123478-HxCDF	104	26-152	
123478-HxCDF	DL= 5.22	3.93	24.4		13C-123678-HxCDF	106	26-123	
123678-HxCDF	DL= 5.42	2.94	24.4		13C-234678-HxCDF	107	28-136	
234678-HxCDF	DL= 6.15	4.32	24.4		13C-123789-HxCDF	117	29-147	
123789-HxCDF	DL= 7.14	4.70	24.4		13C-1234678-HpCDF	69.9	28-143	
1234678-HpCDF	29.3	4.24	24.4		13C-1234789-HpCDF	81.9	26-138	
1234789-HpCDF	DL= 7.51	5.74	24.4					
OCDF	43.4	11.7	48.9	J				

Totals	Conc. (pg/L)	EMPC
Total TCDD	DL= 1.70	
Total PeCDD	DL= 4.63	
Total HxCDD	DL= 8.28	
Total HpCDD	262	
Total TCDF	DL= 2.05	
Total PeCDF	DL= 2.64	
Total HxCDF	23.9	
Total HpCDF	69.2	

CRS			
37Cl4-2378-TCDD	125	35-197	

DL - Signifies Non-Detect (ND<) sample specific detection limit.
EMPC - Estimated Maximum Possible Concentration due to ion abundance ratio failure.
(a) - Lower control limit - Upper control limit
(b) - TEQ based on (2005) World Health Organization (WHO) Toxic Equivalent Factors.

Total Toxic Equivalency (TEQ min.) (b)**:** 1.84 pg/L

Analyst: JMH **Reviewed by: BS**

Section VI: Sample Tracking

SUBCONTRACT ORDER

Apex Laboratories

APIC 4/3/23 **A3D0709**

SENDING LABORATORY: APIC 4/3/23

Apex Laboratories
6700 S.W. Sandburg Street
Tigard, OR 97223
Phone: (503) 718-2323
Fax: (503) 336-0745
Project Manager: Darrell Auvil

RECEIVING LABORATORY:

Ceres Analytical Laboratory, Inc
4919 Windplay Drive, Suite 1
El Dorado Hills, CA 95762
Phone :(916) 932-5011
Fax: -9

Sample Name: STSMH2712 **Water** **Sampled: 04/01/23 07:30** (A3D0709-04)

Analysis	Due	Expires	Comments
1613B Dioxins and Furans (SUB)	04/14/23 17:00	03/31/24 07:30	Ceres
Containers Supplied:			
(D)1 L Amber Glass - Non Preserved			
(E)1 L Amber Glass - Non Preserved			

Sample Name: STSMH1914 **Water** **Sampled: 04/01/23 07:30** (A3D0709-05)

Analysis	Due	Expires	Comments
1613B Dioxins and Furans (SUB)	04/14/23 17:00	03/31/24 07:30	Ceres
Containers Supplied:			
(D)1 L Amber Glass - Non Preserved			
(E)1 L Amber Glass - Non Preserved			

Standard TAT

Released By	Date	Received By	Date
	4.3.23	UPS (Shipper)	
UPS (Shipper)			
Released By	Date	Received By	Date
			4/4/23

Sample Receipt Check List Logged by: HN (initials)

Ceres ID: 16230	Date/Time: 4/4/23 11:25
Client Project ID: A300709	Received Temp: 2.6 °C Acceptable: (Y) / N
Chain of Custody Relinquished by signed?	(Y) / N
Chain of Custody Received by signed?	(Y) / N
Custody Seals? Present?	Y / N
Intact?	Y / N
NA:	(NA)
Unlabeled / Illegible Samples	Y / (N)
Proper Containers:	(Y) / N
Preservation Acceptable (Chemical or ~~Temperature~~)?	(Y) / N
Drinking Water, Sodium Thiosulfate present?	Y / N / (NA)
~~Residual~~ Cl?	Y / (N) / NA
Aqueous sample pH: 7.7	NA
List COC discrepancies: NA 4/4/23	
List Damaged Samples: NA 4/4/23	

Section VII: Qualifiers/Abbreviations

J	Concentration found below the lower quantitation limit but greater than zero.
B	Analyte present in the associated Method Blank.
E	Concentration found exceeds the Calibration range of the HRGC/HRMS.
D	This analyte concentration was calculated from a dilution.
X	The concentration found is the estimated maximum possible concentration due to chlorinated diphenyl ethers present in the sample.
H	Recovery limits exceeded. See cover letter.
*****	Results taken from dilution.
I	Interference. See cover letter.
Conc.	Concentration Found
DL	Calculated Detection Limit
ND	Non-Detect
% Rec.	Percent Recovery

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

Tuesday, April 25, 2023

Ariel Mosbrucker
Geosyntec Consultants, Inc
920 SW Sixth Avenue, Suite 600
Portland, OR 97204

RE: A3D1042 - POP - T4 Stormwater - PNW0319AR

Thank you for using Apex Laboratories. We greatly appreciate your business and strive to provide the highest quality services to the environmental industry.

Enclosed are the results of analyses for work order A3D1042, which was received by the laboratory on 4/10/2023 at 3:54:00PM.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: DAuvil@apex-labs.com, or by phone at 503-718-2323.

Please note: All samples will be disposed of within 30 days of sample receipt, unless prior arrangements have been made.

Cooler Receipt Information

(See Cooler Receipt Form for details)

Default Cooler	1.4 degC

This Final Report is the official version of the data results for this sample submission, unless superseded by a subsequent, labeled amended report.
All other deliverables derived from this data, including Electronic Data Deliverables (EDDs), CLP-like forms, client requested summary sheets, and all other products are considered secondary to this report.

Apex Laboratories

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Darrell Auvil, Client Services Manager

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0319AR**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A3D1042 - 04 25 23 1720**

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
STSMH2710	A3D1042-01	Water	04/09/23 13:01	04/10/23 15:54
STSMH2603	A3D1042-02	Water	04/09/23 13:05	04/10/23 15:54
STSMH2615	A3D1042-03	Water	04/09/23 13:12	04/10/23 15:54
STSMH2712	A3D1042-04	Water	04/10/23 12:30	04/10/23 15:54
STSMH1914	A3D1042-05	Water	04/10/23 12:42	04/10/23 15:54
STSMH2712-DUP	A3D1042-06	Water	04/10/23 12:30	04/10/23 15:54

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Darrell Auvil, Client Services Manager

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6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0319AR**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A3D1042 - 04 25 23 1720**

ANALYTICAL SAMPLE RESULTS

Polychlorinated Biphenyls by EPA 8082A

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
STSMH1914 (A3D1042-05)				**Matrix: Water**		**Batch: 23D0824**		**C-07**
Aroclor 1016	ND	0.0102	0.0204	ug/L	1	04/21/23 10:38	EPA 8082A	
Aroclor 1221	ND	0.0102	0.0204	ug/L	1	04/21/23 10:38	EPA 8082A	
Aroclor 1232	ND	0.0102	0.0204	ug/L	1	04/21/23 10:38	EPA 8082A	
Aroclor 1242	ND	0.0102	0.0204	ug/L	1	04/21/23 10:38	EPA 8082A	
Aroclor 1248	ND	0.0102	0.0204	ug/L	1	04/21/23 10:38	EPA 8082A	
Aroclor 1254	ND	0.0102	0.0204	ug/L	1	04/21/23 10:38	EPA 8082A	
Aroclor 1260	ND	0.0102	0.0204	ug/L	1	04/21/23 10:38	EPA 8082A	
Aroclor 1262	ND	0.0102	0.0204	ug/L	1	04/21/23 10:38	EPA 8082A	
Aroclor 1268	ND	0.0102	0.0204	ug/L	1	04/21/23 10:38	EPA 8082A	
Surrogate: Decachlorobiphenyl (Surr)		*Recovery: 70 %*		*Limits: 40-135 %*	*1*	*04/21/23 10:38*	*EPA 8082A*	

Apex Laboratories

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Darrell Auvil, Client Services Manager

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0319AR**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A3D1042 - 04 25 23 1720**

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
STSMH2712 (A3D1042-04RE1)				**Matrix: Water**		**Batch: 23D0567**		
Acenaphthene	ND	0.0160	0.0320	ug/L	1	04/14/23 15:00	EPA 8270E LVI	
Acenaphthylene	ND	0.0160	0.0320	ug/L	1	04/14/23 15:00	EPA 8270E LVI	
Anthracene	**0.0244**	0.0160	0.0320	ug/L	1	04/14/23 15:00	EPA 8270E LVI	**J**
Benz(a)anthracene	**0.0188**	0.00799	0.0160	ug/L	1	04/14/23 15:00	EPA 8270E LVI	**M-05**
Benzo(a)pyrene	**0.0268**	0.00799	0.0160	ug/L	1	04/14/23 15:00	EPA 8270E LVI	
Benzo(b)fluoranthene	**0.0467**	0.00799	0.0160	ug/L	1	04/14/23 15:00	EPA 8270E LVI	
Benzo(k)fluoranthene	**0.0164**	0.00799	0.0160	ug/L	1	04/14/23 15:00	EPA 8270E LVI	**M-05**
Benzo(g,h,i)perylene	**0.0244**	0.0160	0.0320	ug/L	1	04/14/23 15:00	EPA 8270E LVI	**J**
Chrysene	**0.0240**	0.00799	0.0160	ug/L	1	04/14/23 15:00	EPA 8270E LVI	**M-05**
Dibenz(a,h)anthracene	ND	0.00799	0.0160	ug/L	1	04/14/23 15:00	EPA 8270E LVI	
Fluoranthene	**0.0316**	0.0160	0.0320	ug/L	1	04/14/23 15:00	EPA 8270E LVI	**J**
Fluorene	ND	0.0160	0.0320	ug/L	1	04/14/23 15:00	EPA 8270E LVI	
Indeno(1,2,3-cd)pyrene	**0.0232**	0.00799	0.0160	ug/L	1	04/14/23 15:00	EPA 8270E LVI	
2-Methylnaphthalene	ND	0.0320	0.0639	ug/L	1	04/14/23 15:00	EPA 8270E LVI	
Naphthalene	**0.0427**	0.0320	0.0639	ug/L	1	04/14/23 15:00	EPA 8270E LVI	**J**
Phenanthrene	ND	0.0320	0.0639	ug/L	1	04/14/23 15:00	EPA 8270E LVI	
Pyrene	**0.0276**	0.0160	0.0320	ug/L	1	04/14/23 15:00	EPA 8270E LVI	**J**
Surrogate: Acenaphthylene-d8 (Surr)		*Recovery:*	*125 %*	*Limits: 78-134 %*	*1*	*04/14/23 15:00*	*EPA 8270E LVI*	
Benzo(a)pyrene-d12 (Surr)			*127 %*	*80-132 %*	*1*	*04/14/23 15:00*	*EPA 8270E LVI*	
STSMH2712-DUP (A3D1042-06RE1)				**Matrix: Water**		**Batch: 23D0567**		
Acenaphthene	ND	0.0161	0.0322	ug/L	1	04/14/23 15:33	EPA 8270E LVI	
Acenaphthylene	ND	0.0161	0.0322	ug/L	1	04/14/23 15:33	EPA 8270E LVI	
Anthracene	**0.0225**	0.0161	0.0322	ug/L	1	04/14/23 15:33	EPA 8270E LVI	**J**
Benz(a)anthracene	**0.0153**	0.00804	0.0161	ug/L	1	04/14/23 15:33	EPA 8270E LVI	**J**
Benzo(a)pyrene	**0.0241**	0.00804	0.0161	ug/L	1	04/14/23 15:33	EPA 8270E LVI	
Benzo(b)fluoranthene	**0.0418**	0.00804	0.0161	ug/L	1	04/14/23 15:33	EPA 8270E LVI	
Benzo(k)fluoranthene	**0.0137**	0.00804	0.0161	ug/L	1	04/14/23 15:33	EPA 8270E LVI	**J**
Benzo(g,h,i)perylene	**0.0225**	0.0161	0.0322	ug/L	1	04/14/23 15:33	EPA 8270E LVI	**J**
Chrysene	**0.0217**	0.00804	0.0161	ug/L	1	04/14/23 15:33	EPA 8270E LVI	**M-05**
Dibenz(a,h)anthracene	ND	0.00804	0.0161	ug/L	1	04/14/23 15:33	EPA 8270E LVI	
Fluoranthene	**0.0310**	0.0161	0.0322	ug/L	1	04/14/23 15:33	EPA 8270E LVI	**J**
Fluorene	ND	0.0161	0.0322	ug/L	1	04/14/23 15:33	EPA 8270E LVI	

Apex Laboratories

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Darrell Auvil, Client Services Manager

APEX LABORATORIES

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0319AR**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A3D1042 - 04 25 23 1720**

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
STSMH2712-DUP (A3D1042-06RE1)				**Matrix: Water**		**Batch: 23D0567**		
Indeno(1,2,3-cd)pyrene	**0.0229**	0.00804	0.0161	ug/L	1	04/14/23 15:33	EPA 8270E LVI	
2-Methylnaphthalene	ND	0.0322	0.0643	ug/L	1	04/14/23 15:33	EPA 8270E LVI	
Naphthalene	**0.0402**	0.0322	0.0643	ug/L	1	04/14/23 15:33	EPA 8270E LVI	**J**
Phenanthrene	ND	0.0322	0.0643	ug/L	1	04/14/23 15:33	EPA 8270E LVI	
Pyrene	**0.0261**	0.0161	0.0322	ug/L	1	04/14/23 15:33	EPA 8270E LVI	**J**
Surrogate: Acenaphthylene-d8 (Surr)		*Recovery:*	*125 %*	*Limits:* *78-134 %*	*1*	*04/14/23 15:33*	*EPA 8270E LVI*	
Benzo(a)pyrene-d12 (Surr)			*128 %*	*80-132 %*	*1*	*04/14/23 15:33*	*EPA 8270E LVI*	

Apex Laboratories

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Darrell Auvil, Client Services Manager

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

ANALYTICAL REPORT

Geosyntec Consultants, Inc	Project: POP - T4 Stormwater	
920 SW Sixth Avenue, Suite 600	Project Number: PNW0319AR	Report ID:
Portland, OR 97204	Project Manager: Ariel Mosbrucker	A3D1042 - 04 25 23 1720

ANALYTICAL SAMPLE RESULTS

Solid and Moisture Determinations

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
STSMH2710 (A3D1042-01)				**Matrix: Water**				
Batch: 23D0496								
Total Suspended Solids	**6.00**	---	5.00	mg/L	1	04/12/23 19:11	SM 2540 D	**EST_s**
STSMH2603 (A3D1042-02)				**Matrix: Water**				
Batch: 23D0496								
Total Suspended Solids	**7.00**	---	5.00	mg/L	1	04/12/23 19:11	SM 2540 D	**EST_s**
STSMH2615 (A3D1042-03)				**Matrix: Water**				
Batch: 23D0496								
Total Suspended Solids	**19.0**	---	5.00	mg/L	1	04/12/23 19:11	SM 2540 D	**EST_s**
STSMH2712 (A3D1042-04)				**Matrix: Water**				
Batch: 23D0496								
Total Suspended Solids	**7.00**	---	5.00	mg/L	1	04/12/23 19:11	SM 2540 D	**EST_s**
STSMH1914 (A3D1042-05)				**Matrix: Water**				
Batch: 23D0496								
Total Suspended Solids	**92.0**	---	5.00	mg/L	1	04/12/23 19:11	SM 2540 D	
STSMH2712-DUP (A3D1042-06)				**Matrix: Water**				
Batch: 23D0496								
Total Suspended Solids	**9.00**	---	5.00	mg/L	1	04/12/23 19:11	SM 2540 D	**EST_s**

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ORELAP ID: **OR100062**

Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0319AR**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A3D1042 - 04 25 23 1720**

QUALITY CONTROL (QC) SAMPLE RESULTS

Polychlorinated Biphenyls by EPA 8082A

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23D0824 - EPA 3510C (Neutral pH)								**Water**				
Blank (23D0824-BLK1)			Prepared: 04/20/23 11:24		Analyzed: 04/21/23 09:44							**C-07**
EPA 8082A												
Aroclor 1016	ND	0.0100	0.0200	ug/L	1	---	---	---	---	---	---	
Aroclor 1221	ND	0.0100	0.0200	ug/L	1	---	---	---	---	---	---	
Aroclor 1232	ND	0.0100	0.0200	ug/L	1	---	---	---	---	---	---	
Aroclor 1242	ND	0.0100	0.0200	ug/L	1	---	---	---	---	---	---	
Aroclor 1248	ND	0.0100	0.0200	ug/L	1	---	---	---	---	---	---	
Aroclor 1254	ND	0.0100	0.0200	ug/L	1	---	---	---	---	---	---	
Aroclor 1260	ND	0.0100	0.0200	ug/L	1	---	---	---	---	---	---	
Aroclor 1262	ND	0.0100	0.0200	ug/L	1	---	---	---	---	---	---	
Aroclor 1268	ND	0.0100	0.0200	ug/L	1	---	---	---	---	---	---	
Surr: Decachlorobiphenyl (Surr)			*Recovery: 89 %*		*Limits: 40-135 %*			*Dilution: 1x*				
LCS (23D0824-BS1)			Prepared: 04/20/23 11:24		Analyzed: 04/21/23 10:02							**C-07**
EPA 8082A												
Aroclor 1016	0.659	0.0100	0.0200	ug/L	1	1.25	---	53	46-129%	---	---	
Aroclor 1260	0.986	0.0100	0.0200	ug/L	1	1.25	---	79	45-134%	---	---	
Surr: Decachlorobiphenyl (Surr)			*Recovery: 85 %*		*Limits: 40-135 %*			*Dilution: 1x*				
LCS Dup (23D0824-BSD1)			Prepared: 04/20/23 11:24		Analyzed: 04/21/23 10:20							**C-07, Q-19**
EPA 8082A												
Aroclor 1016	0.666	0.0100	0.0200	ug/L	1	1.25	---	53	46-129%	1	30%	
Aroclor 1260	0.944	0.0100	0.0200	ug/L	1	1.25	---	76	45-134%	4	30%	
Surr: Decachlorobiphenyl (Surr)			*Recovery: 84 %*		*Limits: 40-135 %*			*Dilution: 1x*				

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Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0319AR**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A3D1042 - 04 25 23 1720**

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23D0429 - EPA 3511 (Bottle Extraction)							**Water**					
Blank (23D0429-BLK1)			Prepared: 04/12/23 06:39		Analyzed: 04/12/23 12:12							
EPA 8270E LVI												
Acenaphthene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Acenaphthylene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Anthracene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Benz(a)anthracene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Benzo(a)pyrene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Benzo(b)fluoranthene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Benzo(k)fluoranthene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Benzo(g,h,i)perylene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Chrysene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Dibenz(a,h)anthracene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Fluoranthene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Fluorene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Indeno(1,2,3-cd)pyrene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
1-Methylnaphthalene	ND	0.0320	0.0640	ug/L	1	---	---	---	---	---	---	
2-Methylnaphthalene	ND	0.0320	0.0640	ug/L	1	---	---	---	---	---	---	
Naphthalene	ND	0.0320	0.0640	ug/L	1	---	---	---	---	---	---	
Phenanthrene	ND	0.0320	0.0640	ug/L	1	---	---	---	---	---	---	
Pyrene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Carbazole	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Dibenzofuran	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Surr: Acenaphthylene-d8 (Surr)			*Recovery: 116 %*		*Limits: 78-134 %*				*Dilution: 1x*			
Benzo(a)pyrene-d12 (Surr)			*122 %*		*80-132 %*				*"*			
LCS (23D0429-BS1)			Prepared: 04/12/23 06:39		Analyzed: 04/12/23 12:45							
EPA 8270E LVI												
Acenaphthene	1.65	0.0160	0.0320	ug/L	1	1.60	---	103	80-120%	---	---	
Acenaphthylene	1.82	0.0160	0.0320	ug/L	1	1.60	---	114	80-124%	---	---	
Anthracene	1.72	0.0160	0.0320	ug/L	1	1.60	---	108	80-123%	---	---	
Benz(a)anthracene	1.89	0.00800	0.0160	ug/L	1	1.60	---	118	80-122%	---	---	
Benzo(a)pyrene	2.08	0.00800	0.0160	ug/L	1	1.60	---	**130**	**80-129%**	---	---	Q-29
Benzo(b)fluoranthene	2.03	0.00800	0.0160	ug/L	1	1.60	---	**127**	**80-124%**	---	---	Q-29
Benzo(k)fluoranthene	2.01	0.00800	0.0160	ug/L	1	1.60	---	125	80-125%	---	---	
Benzo(g,h,i)perylene	1.75	0.0160	0.0320	ug/L	1	1.60	---	109	80-120%	---	---	

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Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0319AR**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A3D1042 - 04 25 23 1720**

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23D0429 - EPA 3511 (Bottle Extraction)							**Water**					
LCS (23D0429-BS1)			Prepared: 04/12/23 06:39		Analyzed: 04/12/23 12:45							
Chrysene	1.73	0.00800	0.0160	ug/L	1	1.60	---	108	80-120%	---	---	
Dibenz(a,h)anthracene	1.64	0.00800	0.0160	ug/L	1	1.60	---	103	80-120%	---	---	
Fluoranthene	1.69	0.0160	0.0320	ug/L	1	1.60	---	105	80-126%	---	---	
Fluorene	1.68	0.0160	0.0320	ug/L	1	1.60	---	105	77-127%	---	---	
Indeno(1,2,3-cd)pyrene	1.64	0.00800	0.0160	ug/L	1	1.60	---	102	80-121%	---	---	
1-Methylnaphthalene	1.45	0.0320	0.0640	ug/L	1	1.60	---	90	53-148%	---	---	
2-Methylnaphthalene	1.43	0.0320	0.0640	ug/L	1	1.60	---	89	48-150%	---	---	
Naphthalene	1.69	0.0320	0.0640	ug/L	1	1.60	---	106	78-120%	---	---	
Phenanthrene	1.64	0.0320	0.0640	ug/L	1	1.60	---	103	80-120%	---	---	
Pyrene	1.69	0.0160	0.0320	ug/L	1	1.60	---	106	80-125%	---	---	
Carbazole	1.97	0.0160	0.0320	ug/L	1	1.60	---	123	65-141%	---	---	
Dibenzofuran	1.73	0.0160	0.0320	ug/L	1	1.60	---	108	76-121%	---	---	
Surr: Acenaphthylene-d8 (Surr)			*Recovery: 120 %*		*Limits: 78-134 %*				*Dilution: 1x*			
Benzo(a)pyrene-d12 (Surr)			*125 %*		*80-132 %*				*"*			
LCS Dup (23D0429-BSD1)			Prepared: 04/12/23 06:39		Analyzed: 04/12/23 13:18							**Q-19**
EPA 8270E LVI												
Acenaphthene	1.69	0.0160	0.0320	ug/L	1	1.60	---	105	80-120%	2	30%	
Acenaphthylene	1.88	0.0160	0.0320	ug/L	1	1.60	---	118	80-124%	3	30%	
Anthracene	1.75	0.0160	0.0320	ug/L	1	1.60	---	109	80-123%	1	30%	
Benz(a)anthracene	1.89	0.00800	0.0160	ug/L	1	1.60	---	118	80-122%	0.02	30%	
Benzo(a)pyrene	2.08	0.00800	0.0160	ug/L	1	1.60	---	**130**	**80-129%**	0.2	30%	Q-29
Benzo(b)fluoranthene	2.02	0.00800	0.0160	ug/L	1	1.60	---	**126**	**80-124%**	0.8	30%	Q-29
Benzo(k)fluoranthene	2.00	0.00800	0.0160	ug/L	1	1.60	---	125	80-125%	0.4	30%	
Benzo(g,h,i)perylene	1.73	0.0160	0.0320	ug/L	1	1.60	---	108	80-120%	1	30%	
Chrysene	1.77	0.00800	0.0160	ug/L	1	1.60	---	111	80-120%	2	30%	
Dibenz(a,h)anthracene	1.67	0.00800	0.0160	ug/L	1	1.60	---	104	80-120%	2	30%	
Fluoranthene	1.71	0.0160	0.0320	ug/L	1	1.60	---	107	80-126%	1	30%	
Fluorene	1.74	0.0160	0.0320	ug/L	1	1.60	---	109	77-127%	4	30%	
Indeno(1,2,3-cd)pyrene	1.62	0.00800	0.0160	ug/L	1	1.60	---	101	80-121%	0.9	30%	
1-Methylnaphthalene	1.48	0.0320	0.0640	ug/L	1	1.60	---	93	53-148%	2	30%	
2-Methylnaphthalene	1.49	0.0320	0.0640	ug/L	1	1.60	---	93	48-150%	4	30%	
Naphthalene	1.74	0.0320	0.0640	ug/L	1	1.60	---	109	78-120%	3	30%	
Phenanthrene	1.62	0.0320	0.0640	ug/L	1	1.60	---	101	80-120%	2	30%	

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ORELAP ID: **OR100062**

Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0319AR**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A3D1042 - 04 25 23 1720**

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23D0429 - EPA 3511 (Bottle Extraction)							**Water**					
LCS Dup (23D0429-BSD1)			Prepared: 04/12/23 06:39		Analyzed: 04/12/23 13:18							**Q-19**
Pyrene	1.71	0.0160	0.0320	ug/L	1	1.60	---	107	80-125%	0.8	30%	
Carbazole	1.98	0.0160	0.0320	ug/L	1	1.60	---	124	65-141%	0.6	30%	
Dibenzofuran	1.78	0.0160	0.0320	ug/L	1	1.60	---	111	76-121%	3	30%	
Surr: Acenaphthylene-d8 (Surr)			*Recovery: 121 %*		*Limits: 78-134 %*				*Dilution: 1x*			
Benzo(a)pyrene-d12 (Surr)			*123 %*		*80-132 %*				*"*			

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920 SW Sixth Avenue, Suite 600	Project Number: **PNW0319AR**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A3D1042 - 04 25 23 1720**

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23D0567 - EPA 3511 (Bottle Extraction)							**Water**					
Blank (23D0567-BLK1)			Prepared: 04/14/23 06:05		Analyzed: 04/14/23 12:47							
EPA 8270E LVI												
Acenaphthene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Acenaphthylene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Anthracene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Benz(a)anthracene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Benzo(a)pyrene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Benzo(b)fluoranthene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Benzo(k)fluoranthene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Benzo(g,h,i)perylene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Chrysene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Dibenz(a,h)anthracene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Fluoranthene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Fluorene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Indeno(1,2,3-cd)pyrene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
1-Methylnaphthalene	ND	0.0320	0.0640	ug/L	1	---	---	---	---	---	---	
2-Methylnaphthalene	ND	0.0320	0.0640	ug/L	1	---	---	---	---	---	---	
Naphthalene	ND	0.0320	0.0640	ug/L	1	---	---	---	---	---	---	
Phenanthrene	ND	0.0320	0.0640	ug/L	1	---	---	---	---	---	---	
Pyrene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Carbazole	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Dibenzofuran	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Surr: Acenaphthylene-d8 (Surr)			*Recovery: 122 %*		*Limits: 78-134 %*				*Dilution: 1x*			
Benzo(a)pyrene-d12 (Surr)			*122 %*		*80-132 %*				*"*			
LCS (23D0567-BS1)			Prepared: 04/14/23 06:05		Analyzed: 04/14/23 13:20							
EPA 8270E LVI												
Acenaphthene	1.55	0.0160	0.0320	ug/L	1	1.60	---	97	80-120%	---	---	
Acenaphthylene	1.77	0.0160	0.0320	ug/L	1	1.60	---	110	80-124%	---	---	
Anthracene	1.67	0.0160	0.0320	ug/L	1	1.60	---	105	80-123%	---	---	
Benz(a)anthracene	1.77	0.00800	0.0160	ug/L	1	1.60	---	111	80-122%	---	---	
Benzo(a)pyrene	1.94	0.00800	0.0160	ug/L	1	1.60	---	121	80-129%	---	---	
Benzo(b)fluoranthene	1.84	0.00800	0.0160	ug/L	1	1.60	---	115	80-124%	---	---	
Benzo(k)fluoranthene	1.82	0.00800	0.0160	ug/L	1	1.60	---	113	80-125%	---	---	
Benzo(g,h,i)perylene	1.52	0.0160	0.0320	ug/L	1	1.60	---	95	80-120%	---	---	

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920 SW Sixth Avenue, Suite 600	Project Number: **PNW0319AR**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A3D1042 - 04 25 23 1720**

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23D0567 - EPA 3511 (Bottle Extraction)							**Water**					
LCS (23D0567-BS1)			Prepared: 04/14/23 06:05		Analyzed: 04/14/23 13:20							
Chrysene	1.62	0.00800	0.0160	ug/L	1	1.60	---	101	80-120%	---	---	
Dibenz(a,h)anthracene	1.55	0.00800	0.0160	ug/L	1	1.60	---	97	80-120%	---	---	
Fluoranthene	1.65	0.0160	0.0320	ug/L	1	1.60	---	103	80-126%	---	---	
Fluorene	1.65	0.0160	0.0320	ug/L	1	1.60	---	103	77-127%	---	---	
Indeno(1,2,3-cd)pyrene	1.46	0.00800	0.0160	ug/L	1	1.60	---	91	80-121%	---	---	
1-Methylnaphthalene	1.50	0.0320	0.0640	ug/L	1	1.60	---	94	53-148%	---	---	
2-Methylnaphthalene	1.49	0.0320	0.0640	ug/L	1	1.60	---	93	48-150%	---	---	
Naphthalene	1.62	0.0320	0.0640	ug/L	1	1.60	---	101	78-120%	---	---	
Phenanthrene	1.51	0.0320	0.0640	ug/L	1	1.60	---	95	80-120%	---	---	
Pyrene	1.63	0.0160	0.0320	ug/L	1	1.60	---	102	80-125%	---	---	
Carbazole	1.96	0.0160	0.0320	ug/L	1	1.60	---	123	65-141%	---	---	
Dibenzofuran	1.70	0.0160	0.0320	ug/L	1	1.60	---	106	76-121%	---	---	
Surr: Acenaphthylene-d8 (Surr)			*Recovery: 124 %*		*Limits: 78-134 %*				*Dilution: 1x*			
Benzo(a)pyrene-d12 (Surr)			*124 %*		*80-132 %*				*"*			
LCS Dup (23D0567-BSD1)			Prepared: 04/14/23 06:05		Analyzed: 04/14/23 13:54							**Q-19**
EPA 8270E LVI												
Acenaphthene	1.57	0.0160	0.0320	ug/L	1	1.60	---	98	80-120%	2	30%	
Acenaphthylene	1.82	0.0160	0.0320	ug/L	1	1.60	---	114	80-124%	3	30%	
Anthracene	1.68	0.0160	0.0320	ug/L	1	1.60	---	105	80-123%	0.5	30%	
Benz(a)anthracene	1.77	0.00800	0.0160	ug/L	1	1.60	---	110	80-122%	0.3	30%	
Benzo(a)pyrene	1.98	0.00800	0.0160	ug/L	1	1.60	---	124	80-129%	2	30%	
Benzo(b)fluoranthene	1.85	0.00800	0.0160	ug/L	1	1.60	---	116	80-124%	0.8	30%	
Benzo(k)fluoranthene	1.86	0.00800	0.0160	ug/L	1	1.60	---	116	80-125%	2	30%	
Benzo(g,h,i)perylene	1.53	0.0160	0.0320	ug/L	1	1.60	---	96	80-120%	0.9	30%	
Chrysene	1.64	0.00800	0.0160	ug/L	1	1.60	---	102	80-120%	0.9	30%	
Dibenz(a,h)anthracene	1.57	0.00800	0.0160	ug/L	1	1.60	---	98	80-120%	1	30%	
Fluoranthene	1.64	0.0160	0.0320	ug/L	1	1.60	---	103	80-126%	0.2	30%	
Fluorene	1.67	0.0160	0.0320	ug/L	1	1.60	---	104	77-127%	1	30%	
Indeno(1,2,3-cd)pyrene	1.47	0.00800	0.0160	ug/L	1	1.60	---	92	80-121%	0.5	30%	
1-Methylnaphthalene	1.62	0.0320	0.0640	ug/L	1	1.60	---	101	53-148%	8	30%	
2-Methylnaphthalene	1.57	0.0320	0.0640	ug/L	1	1.60	---	98	48-150%	5	30%	
Naphthalene	1.63	0.0320	0.0640	ug/L	1	1.60	---	102	78-120%	0.5	30%	
Phenanthrene	1.50	0.0320	0.0640	ug/L	1	1.60	---	93	80-120%	1	30%	

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Darrell Auvil, Client Services Manager

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0319AR**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A3D1042 - 04 25 23 1720**

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23D0567 - EPA 3511 (Bottle Extraction)							**Water**					
LCS Dup (23D0567-BSD1)			Prepared: 04/14/23 06:05		Analyzed: 04/14/23 13:54							**Q-19**
Pyrene	1.65	0.0160	0.0320	ug/L	1	1.60	---	103	80-125%	1	30%	
Carbazole	1.95	0.0160	0.0320	ug/L	1	1.60	---	122	65-141%	0.4	30%	
Dibenzofuran	1.71	0.0160	0.0320	ug/L	1	1.60	---	107	76-121%	1	30%	
Surr: Acenaphthylene-d8 (Surr)			*Recovery: 124 %*		*Limits: 78-134 %*				*Dilution: 1x*			
Benzo(a)pyrene-d12 (Surr)			*126 %*		*80-132 %*				*"*			

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Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0319AR**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A3D1042 - 04 25 23 1720**

QUALITY CONTROL (QC) SAMPLE RESULTS

Solid and Moisture Determinations

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 23D0496 - Total Suspended Solids - 2022												**Water**
Blank (23D0496-BLK1)			Prepared: 04/12/23 19:11		Analyzed: 04/12/23 19:11							
SM 2540 D												
Total Suspended Solids	ND	---	5.00	mg/L	1	---	---	---	---	---	---	
Duplicate (23D0496-DUP1)			Prepared: 04/12/23 19:11		Analyzed: 04/12/23 19:11							
QC Source Sample: Non-SDG (A3D1061-01)												
Total Suspended Solids	**12.0**	---	5.00	mg/L	1	---	10.0	---	---	**18.2**	**10%**	EST_s, Q-05
Reference (23D0496-SRM1)			Prepared: 04/12/23 19:11		Analyzed: 04/12/23 19:11							
SM 2540 D												
Total Suspended Solids	944	---		mg/L	1	926		102	85-116%	---	---	

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ORELAP ID: OR100062

ANALYTICAL REPORT

Geosyntec Consultants, Inc	Project: POP - T4 Stormwater	
920 SW Sixth Avenue, Suite 600	Project Number: PNW0319AR	Report ID:
Portland, OR 97204	Project Manager: Ariel Mosbrucker	A3D1042 - 04 25 23 1720

SAMPLE PREPARATION INFORMATION

Polychlorinated Biphenyls by EPA 8082A

Prep: EPA 3510C (Neutral pH)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 23D0824							
A3D1042-05	Water	EPA 8082A	04/10/23 12:42	04/20/23 11:24	980mL/1mL	1000mL/1mL	1.02

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Prep: EPA 3511 (Bottle Extraction)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 23D0567							
A3D1042-04RE1	Water	EPA 8270E LVI	04/10/23 12:30	04/14/23 06:05	125.19mL/5mL	125mL/5mL	1.00
A3D1042-06RE1	Water	EPA 8270E LVI	04/10/23 12:30	04/14/23 06:05	124.35mL/5mL	125mL/5mL	1.01

Solid and Moisture Determinations

Prep: Total Suspended Solids - 2022

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 23D0496							
A3D1042-01	Water	SM 2540 D	04/09/23 13:01	04/12/23 19:11			NA
A3D1042-02	Water	SM 2540 D	04/09/23 13:05	04/12/23 19:11			NA
A3D1042-03	Water	SM 2540 D	04/09/23 13:12	04/12/23 19:11			NA
A3D1042-04	Water	SM 2540 D	04/10/23 12:30	04/12/23 19:11			NA
A3D1042-05	Water	SM 2540 D	04/10/23 12:42	04/12/23 19:11			NA
A3D1042-06	Water	SM 2540 D	04/10/23 12:30	04/12/23 19:11			NA

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920 SW Sixth Avenue, Suite 600	Project Number: **PNW0319AR**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A3D1042 - 04 25 23 1720**

QUALIFIER DEFINITIONS

Client Sample and Quality Control (QC) Sample Qualifier Definitions:

Apex Laboratories

C-07	Extract has undergone Sulfuric Acid Cleanup by EPA 3665A, Sulfur Cleanup by EPA 3660B, and Florisil Cleanup by EPA 3620B in order to minimize matrix interference.
EST_s	Solids results are reported as estimates when less than 2.5 mg residue is recovered during analysis. All method QC requirements have been met for samples, and reporting levels are adjusted based on volume filtered. Results meet regulatory requirements.
J	Estimated Result. Result detected below the lowest point of the calibration curve, but above the specified MDL.
M-05	Estimated results. Peak separation for structural isomers is insufficient for accurate quantification.
Q-05	Analyses are not controlled on RPD values from sample and duplicate concentrations that are below 5 times the reporting level.
Q-19	Blank Spike Duplicate (BSD) sample analyzed in place of Matrix Spike/Duplicate samples due to limited sample amount available for analysis.
Q-29	Recovery for Lab Control Spike (LCS) is above the upper control limit. Data may be biased high.

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ANALYTICAL REPORT

Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0319AR**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A3D1042 - 04 25 23 1720**

REPORTING NOTES AND CONVENTIONS:

Abbreviations:

DET Analyte DETECTED at or above the detection or reporting limit.

ND Analyte NOT DETECTED at or above the detection or reporting limit.

NR Result Not Reported

RPD Relative Percent Difference. RPDs for Matrix Spikes and Matrix Spike Duplicates are based on concentration, not recovery.

Detection Limits: Limit of Detection (LOD)

Limits of Detection (LODs) are normally set at a level of one half the validated Limit of Quantitation (LOQ).
If no value is listed ('-----'), then the data has not been evaluated below the Reporting Limit.

Reporting Limits: Limit of Quantitation (LOQ)

Validated Limits of Quantitation (LOQs) are reported as the Reporting Limits for all analyses where the LOQ, MRL, PQL or CRL are requested. The LOQ represents a level at or above the low point of the calibration curve, that has been validated according to Apex Laboratories' comprehensive LOQ policies and procedures.

Reporting Conventions:

Basis: Results for soil samples are generally reported on a 100% dry weight basis.
The Result Basis is listed following the units as " dry", " wet", or " " (blank) designation.

" dry" Sample results and Reporting Limits are reported on a dry weight basis. (i.e. "ug/kg dry")
See Percent Solids section for details of dry weight analysis.

" wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected, but have not been modified in this case.

" " Results without 'wet' or 'dry' designation are not normally dry weight corrected. These results are considered 'As Received'.

QC Source:

In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) may be analyzed to demonstrate accuracy and precision of the extraction batch.

Non-Client Batch QC Samples (Duplicates and Matrix Spike/Duplicates) may not be included in this report. Please request a Full QC report if this data is required.

Miscellaneous Notes:

" --- " QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

" *** " Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to ½ the Reporting Limit (RL).
-For Blank hits falling between ½ the RL and the RL (J flagged hits), the associated sample and QC data will receive a 'B-02' qualifier.
-For Blank hits above the RL, the associated sample and QC data will receive a 'B' qualifier, per Apex Laboratories' Blank Policy.
For further details, please request a copy of this document.

Apex Laboratories

Darrell Auvil, Client Services Manager

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503-718-2323
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Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0319AR**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A3D1042 - 04 25 23 1720**

REPORTING NOTES AND CONVENTIONS (Cont.):

Blanks (Cont.):

Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the sample results are less than ten times the level found in the blank for inorganic analyses, or less than five times the level found in the blank for organic analyses.

'B' and 'B-02' qualifications are only applied to sample results detected above the Reporting Level.

Preparation Notes:

Mixed Matrix Samples:

Water Samples:

Water samples containing significant amounts of sediment are decanted or separated prior to extraction, and only the water portion analyzed, unless otherwise directed by the client.

Soil and Sediment Samples:

Soil and Sediment samples containing significant amounts of water are decanted prior to extraction, and only the solid portion analyzed, unless otherwise directed by the client.

Sampling and Preservation Notes:

Certain regulatory programs, such as National Pollutant Discharge Elimination System (NPDES), require that activities such as sample filtration (for dissolved metals, orthophosphate, hexavalent chromium, etc.) and testing of short hold analytes (pH, Dissolved Oxygen, etc.) be performed in the field (on-site) within a short time window. In addition, sample matrix spikes are required for some analyses, and sufficient volume must be provided, and billable site specific QC requested, if this is required. All regulatory permits should be reviewed to ensure that these requirements are being met.

Data users should be aware of which regulations pertain to the samples they submit for testing. If related sample collection activities are not approved for a particular regulatory program, results should be considered estimates. Apex Laboratories will qualify these analytes according to the most stringent requirements, however results for samples that are for non-regulatory purposes may be acceptable.

Samples that have been filtered and preserved at Apex Laboratories per client request are listed in the preparation section of the report with the date and time of filtration listed.

Apex Laboratories maintains detailed records on sample receipt, including client label verification, cooler temperature, sample preservation, hold time compliance and field filtration. Data is qualified as necessary, and the lack of qualification indicates compliance with required parameters.

Apex Laboratories

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Darrell Auvil, Client Services Manager

Apex Laboratories, LLC
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Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0319AR**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A3D1042 - 04 25 23 1720**

LABORATORY ACCREDITATION INFORMATION

ORELAP Certification ID: OR100062 (Primary Accreditation) - EPA ID: OR01039

All methods and analytes reported from work performed at Apex Laboratories are included on Apex Laboratories' ORELAP Scope of Certification, with the exception of any analyte(s) listed below:

Apex Laboratories

Matrix	Analysis	TNI_ID	Analyte	TNI_ID	Accreditation

All reported analytes are included in Apex Laboratories' current ORELAP scope.

Secondary Accreditations

Apex Laboratories also maintains reciprocal accreditation with non-TNI states (Washington DOE), as well as other state specific accreditations not listed here.

Subcontract Laboratory Accreditations

Subcontracted data falls outside of Apex Laboratories' Scope of Accreditation.
Please see the Subcontract Laboratory report for full details, or contact your Project Manager for more information.

Field Testing Parameters

Results for Field Tested data are provded by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

Apex Laboratories

Darrell Auvil, Client Services Manager

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APEX LABORATORIES

ANALYTICAL REPORT

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

Geosyntec Consultants, Inc
920 SW Sixth Avenue, Suite 600
Portland, OR 97204

Project: **POP - T4 Stormwater**
Project Number: **PNW0319AR**
Project Manager: **Ariel Mosbrucker**

Report ID:
A3D1042 - 04 25 23 1720

APEX LABS
6700 SW Sandburg St., Tigard, OR 97223 Ph: 503-718-2323

CHAIN OF CUSTODY

Lab # A3D1042 COC 1 of 1

Company: Geosyntec | Project Mgr: Ariel Mosbrucker | Project Name: PoP T4 SW | Project #: PNW0319AR

Address: 920 SW Sixth Ave Suite 600, Portland, OR | Phone: 971-271-5902 | Email: amosbrucker@geosyntec.com | PO #

Sampled by: AM, MDB, JL

Site Location:
State OR
County Mult.

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	# OF CONTAINERS	NWTPH-HCID	NWTPH-Dx	NWTPH-Gx	8260 BTEX	8260 RBDM VOCs	8260 Halo VOCs	8260 VOCs Full List	8270 SIM PAHs - LL	8270 Semi-Vols Full List	8082 PCBs - LL	8081 Pesticides	RCRA Metals (8)	Priority Metals (13)	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Hg, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Tl, V, Zn TOTAL DISS. TCLP	TCLP Metals (8)	SM2540D-TSS	EPA1613B-dioxins+furans	Hold Sample	Frozen Archive
STSMH2710	4/9/23	1301	SW	1																X			
STSMH2603	4/9/23	1305	SW	1																X			
STSMH2615	4/9/23	1312	SW	1																X			
STSMH2712	4/10/23	1230	SW	5								X								X	X		
STSMH1914	4/10/23	1242	SW	5										X						X	X		
STSMH2712-DUP	4/10/23	1230	SW	5								X								X	X		

Standard Turn Around Time (TAT) = 10 Business Days

TAT Requested (circle): 1 Day 2 Day 3 Day 5 Day **(Standard)** Other: ______

SPECIAL INSTRUCTIONS: Avoid dilution when possible

SAMPLES ARE HELD FOR 30 DAYS

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature: [signature] Date: 4/10/23	Signature: [signature] Date: 4/10/23	Signature: Date:	Signature: Date:
Printed Name: Jack Lisin Time: 1554	Printed Name: Katrina Mariposa Time: 15:54	Printed Name: Time:	Printed Name: Time:
Company: Geosyntec	Company: Apex	Company:	Company:

Form Y-002 R-00

Apex Laboratories

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920 SW Sixth Avenue, Suite 600	Project Number: **PNW0319AR**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A3D1042 - 04 25 23 1720**

APEX LABS COOLER RECEIPT FORM

Client: GeoSyntec Element WO#: A3D1042

Project/Project #: POP T4 SW/PNW0319AR

Delivery Info:

Date/time received: 4/10/23 @15:54 By: ZAM

Delivered by: Apex__Client X ESS__FedEx__UPS__Radio__Morgan__SDS__Evergreen__Other__

Cooler Inspection Date/time inspected: 4/10/23 @ 15:55 By: ZAM

Chain of Custody included? Yes X No ____

Signed/dated by client? Yes X No ____

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (°C)	1.4						
Custody seals? (Y/N)	N						
Received on ice? (Y/N)	Y						
Temp. blanks? (Y/N)	N						
Ice type: (Gel/Real/Other)	Real						
Condition (In/Out):	In						

Cooler out of temp? (Y/N) Possible reason why:

Green dots applied to out of temperature samples? Yes/No

Out of temperature samples form initiated? Yes No

Sample Inspection: Date/time inspected: 4/10/23 @16:07 By: ZAM

All samples intact? Yes X No ___ Comments:

Bottle labels/COCs agree? Yes X No ___ Comments:

COC/container discrepancies form initiated? Yes ___ No X

Containers/volumes received appropriate for analysis? Yes X No ___ Comments:

Do VOA vials have visible headspace? Yes ___ No ___ NA X

Comments

Water samples: pH checked: Yes___No___NA X pH appropriate? Yes___No___NA X

Comments:

Additional information:

Labeled by: ZAM Witness: DJS Cooler Inspected by: ZAM

Form Y-003 R-00

Apex Laboratories

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Darrell Auvil, Client Services Manager

CERES Analytical Laboratory, Inc.
4919 Windplay Dr. Suite 1, El Dorado Hills, CA 95762

April 20, 2023 Ceres ID: 16252

Apex Laboratories
6700 S.W. Sandburg Street
Tigard, OR 97223

The following report contains the results for the three aqueous samples received on April 12, 2023. These samples were analyzed for tetra through octa chlorinated dioxins and dibenzofurans by EPA method 1613. Standard 2-week turn-around time was provided for this work.

This work was authorized under Apex Laboratories' Project # A3D1042.

Continuing Calibration Verification (CCV) Requirements
All associated calibration verification standard(s) (CCV) met the acceptance criteria.

The report consists of a Cover Letter, Sample Inventory (Section I), Data Summary (Section II), Sample Tracking (Section VI), and Qualifiers/Abbreviations (Section VII). Raw Data (Section III), Continuing Calibration (Section IV), and Initial Calibration (Section V) are available in a full report (.pdf format) upon request.

If you have any questions regarding this report, please feel free to contact me at (916)932-5011.

Sincerely,

James M. Hedin
Director of Operations/CEO
jhedin@ceres-lab.com

Section I: Sample Inventory

Ceres Sample ID:	Sample ID	Date Received	Collection Date &Time
16252-001	STSMH2712 (A3D1042-04)	4/12/2023	4/10/2023 12:30
16252-002	STSMH1914 (A3D1042-05)	4/12/2023	4/10/2023 12:42
16252-003	STSMH2712-Dup (A3D1042-06)	4/12/2023	4/10/2023 12:30

Section II: Data Summary

CERES Analytical Laboratory, Inc.
4919 Windplay Dr. Suite 1, El Dorado Hills, CA 95762

EPA Method 1613B

Quality Assurance Sample **Method Blank**	**QC Batch #:** 2848 **Matrix:** Aqueous	**Date Received:** NA **Date Extracted:** 4/17/2023
Project ID: A3D1042	**Sample Size:** 1.000 L	**Date Analyzed:** 4/18/2023

Analyte	Conc. (pg/L)	MDL	RL	Qual.
2,3,7,8-TCDD	DL= 3.18	0.887	5.00	
12378-PeCDD	DL= 6.55	2.56	25.0	
123478-HxCDD	DL= 6.09	3.08	25.0	
123678-HxCDD	DL= 5.71	5.29	25.0	
123789-HxCDD	DL= 5.62	13.1	25.0	
1234678-HpCDD	DL= 8.94	5.15	25.0	
OCDD	DL= 15.1	8.50	50.0	
2,3,7,8-TCDF	DL= 2.85	0.733	5.00	
12378-PeCDF	DL= 3.86	2.96	25.0	
23478-PeCDF	DL= 3.64	5.40	25.0	
123478-HxCDF	DL= 2.47	3.93	25.0	
123678-HxCDF	DL= 2.44	2.94	25.0	
234678-HxCDF	DL= 2.72	4.32	25.0	
123789-HxCDF	DL= 3.60	4.70	25.0	
1234678-HpCDF	DL= 6.04	4.24	25.0	
1234789-HpCDF	DL= 7.38	5.74	25.0	
OCDF	DL= 13.9	11.7	50.0	

Totals	Conc. (pg/L)	EMPC
Total TCDD	DL= 3.18	
Total PeCDD	DL= 6.55	
Total HxCDD	DL= 6.09	
Total HpCDD	DL= 8.94	
Total TCDF	DL= 2.85	
Total PeCDF	DL= 3.86	
Total HxCDF	DL= 3.60	
Total HpCDF	DL= 7.38	

Labeled Standards	% R	LCL-UCL (a)	Qualifiers
13C-2378-TCDD	83.7	25-164	
13C-12378-PeCDD	99.5	25-181	
13C-123478-HxCDD	71.5	32-141	
13C-123678-HxCDD	91.5	28-130	
13C-1234678-HpCDD	55.6	23-140	
13C-OCDD	50.4	17-157	
13C-2378-TCDF	69.4	24-169	
13C-12378-PeCDF	101	24-185	
13C-23478-PeCDF	92.6	21-178	
13C-123478-HxCDF	93.1	26-152	
13C-123678-HxCDF	94.7	26-123	
13C-234678-HxCDF	101	28-136	
13C-123789-HxCDF	102	29-147	
13C-1234678-HpCDF	66.3	28-143	
13C-1234789-HpCDF	68.4	26-138	

CRS

37Cl4-2378-TCDD	105	35-197	

DL - Signifies Non-Detect (ND<) sample specific detection limit.
EMPC - Estimated Maximum Possible Concentration due to ion abundance ratio failure.
(a) - Lower control limit - Upper control limit
(b) - TEQ based on (2005) World Health Organization (WHO) Toxic Equivalent Factors.

Total Toxic Equivalency (TEQ min.) (b)**:** 0.0 pg/L

Analyst: JMH **Reviewed by: BS**

CERES Analytical Laboratory, Inc.
4919 Windplay Dr. Suite 1, El Dorado Hills, CA 95762

EPA Method 1613B

Quality Assurance Sample Ongoing Precision and Recovery		Date Received: NA
	QC Batch #: 2848	Date Extracted: 4/17/2023
	Matrix: Aqueous	Date Analyzed: 4/18/2023
Project ID: A3D1042	Sample Size: 1.000 L	

Analyte	Conc. (ng/mL)	Limits (a)	Labeled Standards	% Rec.	Limits (a)
2,3,7,8-TCDD	9.19	6.7-15.8	13C-2378-TCDD	80.1	20-175
12378-PeCDD	57.0	35-71	13C-12378-PeCDD	92.7	21-227
123478-HxCDD	55.7	35-82	13C-123478-HxCDD	70.5	21-193
123678-HxCDD	56.7	38-67	13C-123678-HxCDD	79.4	25-163
123789-HxCDD	51.4	32-81	13C-1234678-HpCDD	53.2	26-166
1234678-HpCDD	56.6	35-70	13C-OCDD	51.9	13-198
OCDD	107	78-144	13C-2378-TCDF	67.4	22-152
2,3,7,8-TCDF	9.64	7.5-15.8	13C-12378-PeCDF	98.3	21-192
12378-PeCDF	51.1	40-67	13C-23478-PeCDF	90.9	13-328
23478-PeCDF	54.1	34-80	13C-123478-HxCDF	87.5	19-202
123478-HxCDF	48.8	36-67	13C-123678-HxCDF	88.7	21-159
123678-HxCDF	52.7	42-65	13C-234678-HxCDF	93.7	22-176
234678-HxCDF	50.3	35-78	13C-123789-HxCDF	97.6	17-205
123789-HxCDF	51.7	39-65	13C-1234678-HpCDF	62.8	21-158
1234678-HpCDF	55.9	41-61	13C-1234789-HpCDF	64.6	20-186
1234789-HpCDF	56.1	39-69			
OCDF	122	63-170			
			CRS		
			37Cl4-2378-TCDD	114	31-191

(a) Limits based on method acceptance criteria.

Analyst: JMH **Reviewed by: BS**

CERES Analytical Laboratory, Inc.
4919 Windplay Dr. Suite 1, El Dorado Hills, CA 95762

EPA Method 1613B

Client Sample ID: STSMH2712 (A3D1042-04)		
Project ID: A3D1042	**Ceres Sample ID:** 16252-001	**Date Received:** 4/12/2023
	QC Batch #: 2848	**Date Extracted:** 4/17/2023
Date Collected: 4/10/2023	**Matrix:** Aqueous	**Date Analyzed:** 4/18/2023
Time Collected: 12:30	**Sample Size:** 1.012 L	

Analyte	Conc. (pg/L)	MDL	RL	Qual.
2,3,7,8-TCDD	DL= 4.04	0.887	4.94	
12378-PeCDD	DL= 11.4	2.56	24.7	
123478-HxCDD	DL= 14.5	3.08	24.7	
123678-HxCDD	DL= 14.0	5.29	24.7	
123789-HxCDD	DL= 13.8	13.1	24.7	
1234678-HpCDD	67.7	5.15	24.7	
OCDD	346	8.50	49.4	
2,3,7,8-TCDF	DL= 4.26	0.733	4.94	
12378-PeCDF	DL= 7.26	2.96	24.7	
23478-PeCDF	DL= 6.41	5.40	24.7	
123478-HxCDF	DL= 6.74	3.93	24.7	
123678-HxCDF	DL= 6.55	2.94	24.7	
234678-HxCDF	DL= 7.30	4.32	24.7	
123789-HxCDF	DL= 8.99	4.70	24.7	
1234678-HpCDF	DL= 11.0	4.24	24.7	
1234789-HpCDF	DL= 11.2	5.74	24.7	
OCDF	DL= 13.0	11.7	49.4	

Totals	Conc. (pg/L)	EMPC
Total TCDD	DL= 4.04	
Total PeCDD	DL= 11.4	
Total HxCDD	DL= 14.5	
Total HpCDD	155	
Total TCDF	DL= 4.26	
Total PeCDF	DL= 7.26	
Total HxCDF	DL= 8.99	
Total HpCDF	DL= 11.2	

Labeled Standards	% R	LCL-UCL (a)	Qualifiers
13C-2378-TCDD	67.1	25-164	
13C-12378-PeCDD	85.4	25-181	
13C-123478-HxCDD	59.0	32-141	
13C-123678-HxCDD	68.4	28-130	
13C-1234678-HpCDD	41.6	23-140	
13C-OCDD	31.2	17-157	
13C-2378-TCDF	51.4	24-169	
13C-12378-PeCDF	81.6	24-185	
13C-23478-PeCDF	76.8	21-178	
13C-123478-HxCDF	68.8	26-152	
13C-123678-HxCDF	69.7	26-123	
13C-234678-HxCDF	72.8	28-136	
13C-123789-HxCDF	78.6	29-147	
13C-1234678-HpCDF	47.7	28-143	
13C-1234789-HpCDF	52.7	26-138	

CRS

37Cl4-2378-TCDD	90.6	35-197

DL - Signifies Non-Detect (ND<) sample specific detection limit.
EMPC - Estimated Maximum Possible Concentration due to ion abundance ratio failure.
(a) - Lower control limit - Upper control limit
(b) - TEQ based on (2005) World Health Organization (WHO) Toxic Equivalent Factors.

Total Toxic Equivalency (TEQ min.) (b)**:** 0.781 pg/L

Analyst: JMH **Reviewed by: BS**

CERES Analytical Laboratory, Inc.
4919 Windplay Dr. Suite 1, El Dorado Hills, CA 95762

EPA Method 1613B

Client Sample ID: STSMH1914 (A3D1042-05)		
Project ID: A3D1042	**Ceres Sample ID:** 16252-002	**Date Received:** 4/12/2023
	QC Batch #: 2848	**Date Extracted:** 4/17/2023
Date Collected: 4/10/2023	**Matrix:** Aqueous	**Date Analyzed:** 4/18/2023
Time Collected: 12:42	**Sample Size:** 1.014 L	

Analyte	Conc. (pg/L)	MDL	RL	Qual.
2,3,7,8-TCDD	DL= 4.52	0.887	4.93	
12378-PeCDD	DL= 11.6	2.56	24.7	
123478-HxCDD	DL= 9.31	3.08	24.7	
123678-HxCDD	DL= 8.75	5.29	24.7	
123789-HxCDD	DL= 8.62	13.1	24.7	
1234678-HpCDD	88.4	5.15	24.7	
OCDD	521	8.50	49.3	
2,3,7,8-TCDF	DL= 4.02	0.733	4.93	
12378-PeCDF	DL= 7.09	2.96	24.7	
23478-PeCDF	DL= 6.24	5.40	24.7	
123478-HxCDF	DL= 7.02	3.93	24.7	
123678-HxCDF	DL= 6.69	2.94	24.7	
234678-HxCDF	DL= 7.28	4.32	24.7	
123789-HxCDF	DL= 9.15	4.70	24.7	
1234678-HpCDF	DL= 11.4	4.24	24.7	
1234789-HpCDF	DL= 12.7	5.74	24.7	
OCDF	DL= 19.5	11.7	49.3	

Totals	Conc. (pg/L)	EMPC
Total TCDD	DL= 4.52	
Total PeCDD	DL= 11.6	
Total HxCDD	DL= 9.31	
Total HpCDD	192	
Total TCDF	DL= 4.02	
Total PeCDF	DL= 7.09	
Total HxCDF	DL= 9.15	
Total HpCDF	DL= 12.7	

Labeled Standards	% R	LCL-UCL (a)	Qualifiers
13C-2378-TCDD	77.4	25-164	
13C-12378-PeCDD	89.2	25-181	
13C-123478-HxCDD	70.2	32-141	
13C-123678-HxCDD	80.8	28-130	
13C-1234678-HpCDD	46.0	23-140	
13C-OCDD	34.5	17-157	
13C-2378-TCDF	57.6	24-169	
13C-12378-PeCDF	86.3	24-185	
13C-23478-PeCDF	82.1	21-178	
13C-123478-HxCDF	81.8	26-152	
13C-123678-HxCDF	87.8	26-123	
13C-234678-HxCDF	85.7	28-136	
13C-123789-HxCDF	91.9	29-147	
13C-1234678-HpCDF	54.0	28-143	
13C-1234789-HpCDF	56.3	26-138	

CRS

37Cl4-2378-TCDD	92.2	35-197	

DL - Signifies Non-Detect (ND<) sample specific detection limit.
EMPC - Estimated Maximum Possible Concentration due to ion abundance ratio failure.
(a) - Lower control limit - Upper control limit
(b) - TEQ based on (2005) World Health Organization (WHO) Toxic Equivalent Factors.

Total Toxic Equivalency (TEQ min.) (b)**:** 1.04 pg/L

Analyst: JMH **Reviewed by: BS**

CERES Analytical Laboratory, Inc.
4919 Windplay Dr. Suite 1, El Dorado Hills, CA 95762

EPA Method 1613B

Client Sample ID: STSMH2712-Dup (A3D1042-06)

Project ID: A3D1042	**Ceres Sample ID:** 16252-003	**Date Received:** 4/12/2023
	QC Batch #: 2848	**Date Extracted:** 4/17/2023
Date Collected: 4/10/2023	**Matrix:** Aqueous	**Date Analyzed:** 4/19/2023
Time Collected: 12:30	**Sample Size:** 1.010 L	

Analyte	Conc. (pg/L)	MDL	RL	Qual.
2,3,7,8-TCDD	DL= 3.82	0.887	4.95	
12378-PeCDD	DL= 7.69	2.56	24.8	
123478-HxCDD	DL= 11.9	3.08	24.8	
123678-HxCDD	DL= 10.4	5.29	24.8	
123789-HxCDD	DL= 10.2	13.1	24.8	
1234678-HpCDD	56.3	5.15	24.8	
OCDD	369	8.50	49.5	
2,3,7,8-TCDF	DL= 4.21	0.733	4.95	
12378-PeCDF	DL= 5.80	2.96	24.8	
23478-PeCDF	DL= 5.78	5.40	24.8	
123478-HxCDF	DL= 3.34	3.93	24.8	
123678-HxCDF	DL= 3.28	2.94	24.8	
234678-HxCDF	DL= 3.44	4.32	24.8	
123789-HxCDF	DL= 4.32	4.70	24.8	
1234678-HpCDF	DL= 16.8	4.24	24.8	
1234789-HpCDF	DL= 17.0	5.74	24.8	
OCDF	DL= 19.7	11.7	49.5	

Totals	Conc. (pg/L)	EMPC
Total TCDD	DL= 3.82	
Total PeCDD	DL= 7.69	
Total HxCDD	DL= 11.9	
Total HpCDD	139	
Total TCDF	DL= 4.21	
Total PeCDF	DL= 5.80	
Total HxCDF	DL= 4.32	
Total HpCDF	DL= 17.0	

Labeled Standards	% R	LCL-UCL (a)	Qualifiers
13C-2378-TCDD	65.7	25-164	
13C-12378-PeCDD	82.1	25-181	
13C-123478-HxCDD	63.1	32-141	
13C-123678-HxCDD	71.4	28-130	
13C-1234678-HpCDD	43.3	23-140	
13C-OCDD	34.5	17-157	
13C-2378-TCDF	50.4	24-169	
13C-12378-PeCDF	75.0	24-185	
13C-23478-PeCDF	69.4	21-178	
13C-123478-HxCDF	68.6	26-152	
13C-123678-HxCDF	73.4	26-123	
13C-234678-HxCDF	78.8	28-136	
13C-123789-HxCDF	84.3	29-147	
13C-1234678-HpCDF	47.5	28-143	
13C-1234789-HpCDF	59.0	26-138	

CRS

37Cl4-2378-TCDD	80.9	35-197	

DL - Signifies Non-Detect (ND<) sample specific detection limit.
EMPC - Estimated Maximum Possible Concentration due to ion abundance ratio failure.
(a) - Lower control limit - Upper control limit
(b) - TEQ based on (2005) World Health Organization (WHO) Toxic Equivalent Factors.

Total Toxic Equivalency (TEQ min.) (b)**:** 0.674 pg/L

Analyst: JMH **Reviewed by: BS**

Section VI: Sample Tracking

SUBCONTRACT ORDER

Apex Laboratories

A3D1042

AJAC 4/10/23

SENDING LABORATORY:

Apex Laboratories
6700 S.W. Sandburg Street
Tigard, OR 97223
Phone: (503) 718-2323
Fax: (503) 336-0745
Project Manager: Darrell Auvil

RECEIVING LABORATORY:

Ceres Analytical Laboratory, Inc
4919 Windplay Drive, Suite 1
El Dorado Hills, CA 95762
Phone :(916) 932-5011
Fax: -9

Sample Name: STSMH2712 **Water** **Sampled: 04/10/23 12:30** (A3D1042-04)

Analysis	Due	Expires	Comments
1613B Dioxins and Furans (SUB)	04/21/23 17:00	04/09/24 12:30	Ceres Lab
Containers Supplied:			
(D) 1 L Amber Glass - Non Preserved			
(E) 1 L Amber Glass - Non Preserved			

Sample Name: STSMH1914 **Water** **Sampled: 04/10/23 12:42** (A3D1042-05)

Analysis	Due	Expires	Comments
1613B Dioxins and Furans (SUB)	04/21/23 17:00	04/09/24 12:42	Ceres Lab
Containers Supplied:			
(D) 1 L Amber Glass - Non Preserved			
(E) 1 L Amber Glass - Non Preserved			

Sample Name: STSMH2712-Dup **Water** **Sampled: 04/10/23 12:30** (A3D1042-06)

Analysis	Due	Expires	Comments
1613B Dioxins and Furans (SUB)	04/21/23 17:00	04/09/24 12:30	Ceres Lab
Containers Supplied:			
(D) 1 L Amber Glass - Non Preserved			
(E) 1 L Amber Glass - Non Preserved			

Standard TAT

Released By	Date	Received By	Date
	4-11-23	UPS (Shipper)	
UPS (Shipper)			
Released By	Date	Received By	Date
			4/12/23

Sample Receipt Check List Logged by: HH (initials)

Ceres ID: 16252	Date/Time: 4/12/23 11:00
Client Project ID: A301042	Received Temp: 2.1 °C Acceptable: Y / N
Chain of Custody Relinquished by signed?	Y / N
Chain of Custody Received by signed?	Y / N
Custody Seals? Present?	Y / N
Intact?	Y / N
NA:	NA
Unlabeled / Illegible Samples	Y / N
Proper Containers:	Y / N
Preservation Acceptable (Chemical or Temperature)?	Y / N
Drinking Water, Sodium Thiosulfate present?	Y / N / NA
Residual Cl?	Y / N / NA
Aqueous sample pH: 7,7,7	NA
List COC discrepancies: HH 4/12/23	
List Damaged Samples: HH 4/12/23	

Section VII: Qualifiers/Abbreviations

J	Concentration found below the lower quantitation limit but greater than zero.
B	Analyte present in the associated Method Blank.
E	Concentration found exceeds the Calibration range of the HRGC/HRMS.
D	This analyte concentration was calculated from a dilution.
X	The concentration found is the estimated maximum possible concentration due to chlorinated diphenyl ethers present in the sample.
H	Recovery limits exceeded. See cover letter.
*****	Results taken from dilution.
I	Interference. See cover letter.
Conc.	Concentration Found
DL	Calculated Detection Limit
ND	Non-Detect
% Rec.	Percent Recovery

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - USEPA Method 1613B Dioxin/ Furan Data Review

Project: PNW0319AR- Port of Portland Terminal 4 Stormwater Sampling	Completed by: Anya Epstein	Reviewed by: Todd Olsen
Laboratory Report IDs/Laboratory: A3D0709 and A3D01042/ Apex Laboratories, Tigard, OR	Date: 7/20/2023	Date: 7/31/2023

Item	*Yes*	*No*	*NA*	*Comments*
A. Validation Summary				
1. Were data qualified as a result of the validation?		X		
a. Were any data rejected?		X		
2. Were the qualifications added to the appropriate Excel file (e.g., EDD with qualifiers file or flat file)?			X	
B. Package Completeness				
1. Have the data been provided in a Level II deliverable?	X			
2. Is a laboratory narrative or cover letter present?	X			
3. Has the correct compound list been reported?	X			
4. Are the reporting limits appropriate in order to support the project action limits?		X		The laboratory MDL for 2,3,7,8-TCDD did not meet the SLV stated in the project work plan.
C. Preservation/Lab Receipt/Analysis				
1. Were the samples properly preserved (Aqueous & solid: 0-6^{o}C)?	X			
2. Were the holding times met (1 year from collection to extraction; 40 days from extraction to analysis)	X			
3. For sediment is the % moisture >70% for any of the samples?			X	

Item	*Yes*	*No*	*NA*	*Comments*
4. For sediments, is the % moisture >90% for any of the samples?			X	
5. Were any data qualified based on the responses for this section?		X		
D. Blanks				
1. Was a method blank analyzed at the proper frequency?	X			
a. Were analytes detected in the method blank?		X		
2. Were source blanks analyzed?		X		
a. Were analytes detected in the source blank?			X	
3. Were equipment blanks analyzed?		X		
a. Were analytes detected in the equipment blank?			X	
4. Were any data qualified based on the responses for this section?		X		
E. Quality Control Checks				
Internal Standards				
1. Were the appropriate internal standards listed?	X			
2. Are the recoveries within the laboratory limits?	X			
MS/MSD				
3. Frequency of 1/20 samples?		X		No MS/MSD pairs were reported. OPR samples were used to assess accuracy, and batch-specific precision was not assessed.
4. Were full analyte spikes used for the MS/MSD?			X	
5. Spike recoveries within limits?			X	
6. RPD within limits?			X	

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - USEPA Method 1613B Dioxin/ Furan Data Review

Item	*Yes*	*No*	*NA*	*Comments*
OPR				
7. Was an OPR sample analyzed with each analytical batch?	X			
8. Were full analyte spikes used for the OPR?	X			
9. Were recoveries within the laboratory limits?	X			
10. Were any data qualified based on the responses for this section?		X		
F. Compound Identification and Quantitation				
1. Were samples analyzed at a dilution?		X		
a. Were reporting limits adjusted for dilution?			X	
2. Were any data qualified based on the responses for this section?		X		
G. Field Duplicate				
1. Were field duplicates collected?	X			One field duplicate, STSMH2712-DUP, was collected with the sample set, associated with parent sample STSMH2712.
2. Were they within the QAPP or validation acceptance criteria (≤30% RPD for aqueous and ≤50% RPD for solid)?	X			
3. Were any data qualified based on the responses for this section?		X		

Comments: The OCDF result for sample STSMH1914 was J flagged in the level II laboratory report due to the sample result being greater than the MDL but less than the RL; however, the J flag was not included for this result in the EDD. A J qualifier was added to the validation EDD for consistency with the laboratory report.

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - USEPA Method 1613B Dioxin/ Furan Data Review

INSTRUCTIONS

1. Data shall be qualified using professional judgment along with Method 1613B and the guidance provided in the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, November 2020 (EPA 540-R-20-005).
2. Data qualifiers which will be applied to the data as applicable are as follows:
   U: The analyte was analyzed for, but was not detected at or above the reported sample quantitation limit. Upon application of the U qualifier to a reported result, the definition changes to "not detected at or above the reported result".
   J: The analyte was positively identified; the associated numerical value is an estimated concentration of the analyte in the sample.
   J-: The analyte was positively identified; the associated numerical value is an estimated concentration, the result may be biased low.
   J+: The analyte was positively identified; the associated numerical value is an estimated concentration, the result may be biased high.
   UJ: The analyte was not detected at or above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
   R: The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - USEPA Method 1613B Dioxin/ Furan Data Review

ACRONYMS

EDD	Electronic Data Deliverable
EPA	Environmental Protection Agency
ID	Identification
MDL	Method Detection Limit
MS/MSD	Matrix Spike/Matrix spike duplicate
NA	Not applicable
OPR	Ongoing Precision and Recovery
RPD	Relative percent difference
SLV	Surface Water Screening Level Values from Table 3-1 of the Portland Harbor Joint Source Control Strategy (DEQ and EPA, 2005).
USEPA	United States Environmental Protection Agency

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - USEPA Method 1613B Dioxin/ Furan Data Review

DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits and RPD outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other
14	Lab flag removed; no validation qualification required

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - Standard Method 2540D Total Suspended Solids Data Review

Project: PNW0319AR- Port of Portland Terminal 4 Stormwater Sampling	Completed by: Anya Epstein	Reviewed by: Todd Olsen
Laboratory Report IDs/ Laboratory: A3D0709 and A3D01042/ Apex Laboratories, Tigard, OR	Date: 7/20/2023	Date: 7/31/2023

Item	*Yes*	*No*	*NA*	*Comments*
A. Validation Summary				
1. Were data qualified as a result of the validation?	X			Refer to the comments section at the end of this checklist.
a. Were any data rejected?		X		
2. Were the qualifications added to the appropriate Excel file (e.g., EDD with qualifiers file or flat file)?	X			
B. Package Completeness				
1. Have the data been provided in a Level II deliverable?	X			
2. Is a laboratory narrative or cover letter present?	X			
3. Has the correct compound list been reported?	X			
4. Are the reporting limits appropriate in order to support the project action limits?			X	
C. Preservation/Lab Receipt/Analysis				
1. Were the samples properly preserved (Aqueous & solid: 0-6ºC)?	X			
2. Were the holding times met (7 days from sampling to analysis for both aqueous and solid samples)?	X			

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - Standard Method 2540D Total Suspended Solids Data Review

Item	*Yes*	*No*	*NA*	*Comments*
5. Were any data qualified based on the responses for this section?		X		
D. Blanks				
1. Was a method blank analyzed at the proper frequency?	X			
a. Were analytes detected in the method blank?		X		
2. Were source blanks analyzed?		X		
a. Were analytes detected in the source blank?			X	
3. Were equipment blanks analyzed?		X		
a. Were analytes detected in the equipment blank?			X	
4. Were any data qualified based on the responses for this section?		X		
E. Quality Control Checks				
MS/MSD				
1. Frequency of 1/20 samples?		X		No MS/MSD pairs were reported. SRM samples were used to assess accuracy, and laboratory duplicate samples were used to assess precision.
2. Were full analyte spikes used for the MS/MSD?			X	
3. Spike recoveries within limits?			X	
4. RPD within limits?			X	
SRM				
5. Was an SRM sample analyzed with each analytical batch?	X			
6. Were full analyte spikes used for the SRM?	X			
7. Were recoveries within the laboratory limits?	X			

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - Standard Method 2540D Total Suspended Solids Data Review

Item	*Yes*	*No*	*NA*	*Comments*
10. Were any data qualified based on the responses for this section?		X		
F. Compound Identification and Quantitation				
1. Were samples analyzed at a dilution?		X		
a. Were reporting limits adjusted for dilution?			X	
2. Were any data qualified based on the responses for this section?		X		
G. Laboratory Duplicate				
1. Were laboratory duplicates analyzed with each analytical batch?	X			
2. Were they within the QAPP or validation acceptance criteria (≤30% RPD for aqueous and ≤50% RPD for solid)?	X			
3. Were any data qualified based on the responses for this section?		X		

Comments:

- The TSS concentrations in samples STSMH2712 collected on 4/1/2023, STSMH2712 collected on 4/10/2023, STSMH2710, STSMH2603, STSMH2615, and STSMH2712-DUP were flagged by the laboratory with "EST_s", indicating solids results are reported as estimates when less than 2.5 mg residue is recovered during analysis; all method QC requirements have been met for samples, and reporting levels are adjusted based on volume filtered. Therefore, the TSS concentrations in the associated samples were J flagged as estimated.

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - Standard Method 2540D Total Suspended Solids Data Review

Sample ID	Compound	Laboratory Result (mg/L)	Laboratory Flag	Validation Result (mg/L)	Validation Qualifier	Reason Code
STSMH2712	Total Suspended Solids	13	EST_s	13	J	13
STSMH2710	Total Suspended Solids	6.0	EST_s	6.0	J	13
STSMH2603	Total Suspended Solids	7.0	EST_s	7.0	J	13
STSMH2615	Total Suspended Solids	19	EST_s	19	J	13
STSMH2712	Total Suspended Solids	7.0	EST_s	7.0	J	13
STSMH2712-DUP	Total Suspended Solids	9.0	EST_s	9.0	J	13

mg/L - Milligram per liter

EST_s – Laboratory flag indicating solids results are reported as estimates when less than 2.5 mg residue is recovered during analysis. All method QC requirements have been met for samples, and reporting levels are adjusted based on volume filtered.

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - Standard Method 2540D Total Suspended Solids Data Review

INSTRUCTIONS

1. Data shall be qualified using professional judgment along with Standard Method 2540D and the guidance provided in the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, November 2020 (EPA 542-R-20-006).
2. Data qualifiers which will be applied to the data as applicable are as follows:
   U: The analyte was analyzed for, but was not detected at or above the reported sample quantitation limit. Upon application of the U qualifier to a reported result, the definition changes to "not detected at or above the reported result".
   J: The analyte was positively identified; the associated numerical value is an estimated concentration of the analyte in the sample.
   J-: The analyte was positively identified; the associated numerical value is an estimated concentration, the result may be biased low.
   J+: The analyte was positively identified; the associated numerical value is an estimated concentration, the result may be biased high.
   UJ: The analyte was not detected at or above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
   R: The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - Standard Method 2540D Total Suspended Solids Data Review

ACRONYMS

EDD	Electronic Data Deliverable
ID	Identification
MS/MSD	Matrix Spike/Matrix spike duplicate
NA	Not applicable
RPD	Relative percent difference
SRM	Standard Reference Material
TSS	Total Suspended Solids
USEPA	United States Environmental Protection Agency

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - Standard Method 2540D Total Suspended Solids Data Review

DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits and RPD outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other
14	Lab flag removed; no validation qualification required

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - USEPA Method 8082 Polychlorinated Biphenyl Data Review

Project: PNW0319AR- Port of Portland Terminal 4 Stormwater Sampling	Completed by: Anya Epstein	Reviewed by: Todd Olsen
Laboratory Report IDs/Laboratory: A3D0709 and A3D01042/ Apex Laboratories, Tigard, OR	Date: 7/20/2023	Date: 7/31/2023

Item	*Yes*	*No*	*NA*	*Comments*
A. Validation Summary				
1. Were data qualified as a result of the validation?		X		
a. Were any data rejected?		X		
2. Were the qualifications added to the appropriate Excel file (e.g., EDD with qualifiers file or flat file)?			X	
B. Package Completeness				
1. Have the data been provided in a Level II deliverable?	X			
2. Is a laboratory narrative or cover letter present?	X			
3. Has the correct compound list been reported?	X			
4. Are the reporting limits appropriate in order to support the project action limits?	X			
C. Preservation/Lab Receipt/Analysis				
1. Were the samples properly preserved (Aqueous & solid: 0-6°C)?	X			
2. Were the holding times met (1 year from collection to extraction; 40 days from extraction to analysis)	X			
3. For sediment is the % moisture >70% for any of the samples?			X	

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - USEPA Method 8082 Polychlorinated Biphenyl Data Review

Item	*Yes*	*No*	*NA*	*Comments*
4. For sediments, is the % moisture >90% for any of the samples?			X	
5. Were any data qualified based on the responses for this section?		X		
D. Blanks				
1. Was a method blank analyzed at the proper frequency?	X			
a. Were analytes detected in the method blank?		X		
2. Were source blanks analyzed?		X		
a. Were analytes detected in the source blank?			X	
3. Were equipment blanks analyzed?		X		
a. Were analytes detected in the equipment blank?			X	
4. Were any data qualified based on the responses for this section?		X		
E. Quality Control Checks				
Surrogates				
1. Were the appropriate surrogates listed?	X			
2. Are the recoveries within the laboratory limits?	X			
MS/MSD				
3. Frequency of 1/20 samples?		X		No MS/MSD pairs were reported. LCS/ LCSD pairs were used to assess precision and accuracy.
4. Were full analyte spikes used for the MS/MSD?			X	
5. Spike recoveries within limits?			X	
6. RPD within limits?			X	
LCS/ LCSD				

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - USEPA Method 8082 Polychlorinated Biphenyl Data Review

Item	*Yes*	*No*	*NA*	*Comments*
7. Was an LCS/LCSD pair analyzed with each analytical batch?	X			
8. Were full analyte spikes used for the LCS and LCSD?	X			
9. Were recoveries within the laboratory limits?	X			
10. RPD within limits?	X			
11. Were any data qualified based on the responses for this section?		X		
F. Compound Identification and Quantitation				
1. Were samples analyzed at a dilution?		X		
a. Were reporting limits adjusted for dilution?			X	
2. Were any data qualified based on the responses for this section?		X		
G. Field Duplicate				
1. Were field duplicates collected?		X		
2. Were they within the QAPP or validation acceptance criteria (≤30% RPD for aqueous and ≤50% RPD for solid)?			X	
3. Were any data qualified based on the responses for this section?		X		

Comments:

- All PCB results were flagged by the laboratory with "C-07", indicating the sample extracts underwent sulfuric acid cleanup by EPA method 3665A, sulfur cleanup by EPA method 3660B, and Florisil cleanup by EPA method 3620B in order to minimize matrix interference. Since the batch quality control samples also underwent these cleanup procedures, and based on professional and technical judgement, data quality was not considered affected and no qualifications were applied to the data.

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - USEPA Method 8082 Polychlorinated Biphenyl Data Review

INSTRUCTIONS

1. Data shall be qualified using professional judgment along with Method 8082 and the guidance provided in the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, November 2020 (EPA 540-R-20-005).
2. Data qualifiers which will be applied to the data as applicable are as follows:
   U: The analyte was analyzed for, but was not detected at or above the reported sample quantitation limit. Upon application of the U qualifier to a reported result, the definition changes to "not detected at or above the reported result".
   J: The analyte was positively identified; the associated numerical value is an estimated concentration of the analyte in the sample.
   J-: The analyte was positively identified; the associated numerical value is an estimated concentration, the result may be biased low.
   J+: The analyte was positively identified; the associated numerical value is an estimated concentration, the result may be biased high.
   UJ: The analyte was not detected at or above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
   R: The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - USEPA Method 8082 Polychlorinated Biphenyl Data Review

ACRONYMS

EDD	Electronic Data Deliverable
ID	Identification
LCS/LCSD	Laboratory control spike/Laboratory control spike duplicate
MDL	Method Detection Limit
MS/MSD	Matrix Spike/Matrix spike duplicate
NA	Not applicable
PCB	Polychlorinated Biphenyls
RPD	Relative percent difference
USEPA	United States Environmental Protection Agency

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - USEPA Method 8082 Polychlorinated Biphenyl Data Review

DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits and RPD outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other
14	Lab flag removed; no validation qualification required

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - USEPA Method 8270E Semi-Volatiles Data Review

Project: PNW0319AR- Port of Portland Terminal 4 Stormwater Sampling	Completed by: Anya Epstein	Reviewed by: Todd Olsen
Laboratory Report IDs/Laboratory: A3D0709 and A3D01042/ Apex Laboratories, Tigard, OR	Date: 7/20/2023	Date: 7/31/2023

Item	*Yes*	*No*	*NA*	*Comments*
A. Validation Summary				
1. Were data qualified as a result of the Stage 2A validation?	X			Refer to section G2 and the comments section at the end of this checklist.
a. Were any data rejected?		X		
2. Were the qualifications added to the appropriate Excel file (e.g., EDD with qualifiers file or flat file)?	X			
B. Package Completeness				
1. Have the data been provided in a Level II deliverable?	X			
2. Is a laboratory narrative or cover letter present?	X			
3. Has the correct compound list been reported?	X			
4. Are the reporting limits appropriate in order to support the project action limits?		X		The laboratory MDLs for benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene did not meet CULs stated in the project work plan.
C. Preservation/Lab Receipt/Analysis				
1. Were the samples properly preserved (Aqueous & solid: 0-6^{o}C)?	X			

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - USEPA Method 8270E Semi-Volatiles Data Review

Item	*Yes*	*No*	*NA*	*Comments*
2. Were the holding times met (Aqueous samples- 7 days from collection to extraction, solid samples- 14 days from collection to extraction; analysis- 40 days from extraction to analysis for both aqueous and solid)	X			
3. Were any data qualified based on the responses for this section?		X		
D. Blanks				
1. Was a method blank analyzed at the proper frequency?	X			
a. Were analytes detected in the method blank?		X		
2. Were source blanks analyzed?		X		
a. Were analytes detected in the source blank?			X	
3. Were equipment blanks analyzed?		X		
a. Were analytes detected in the equipment blank?			X	
4. Were any data qualified based on the responses for this section?		X		
E. Quality Control Checks				
Surrogates				
1. Were the appropriate surrogates listed?	X			
2. Are the recoveries within the laboratory limits?	X			
MS/MSD				
3. Frequency of 1/20 samples?		X		No MS/MSD pairs were reported. LCS/ LCSD pairs were used to assess precision and accuracy.
4. Were full analyte spikes used for the MS/MSD?			X	
5. Spike recoveries within limits?			X	
6. RPD within limits?			X	
LCS/ LCSD				

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - USEPA Method 8270E Semi-Volatiles Data Review

Item	*Yes*	*No*	*NA*	*Comments*
7. Was an LCS/ LCSD pair analyzed with each analytical batch?	X			
8. Were full analyte spikes used for the LCS and LCSD?	X			
9. Were recoveries within the laboratory limits?	X			
10. RPD within limits?	X			
11. Were any data qualified based on the responses for this section?		X		
F. Compound Identification and Quantitation				
1. Were samples analyzed at a dilution?		X		
a. Were reporting limits adjusted for dilution?			X	
2. Were any data qualified based on the responses for this section?		X		
G. Field Duplicate				
1. Were field duplicates collected?	X			One field duplicate, STSMH2712-DUP, was collected with the sample set, associated with parent sample STSMH2712.
2. Were they within the validation acceptance criteria (≤30% RPD for aqueous and ≤50% RPD for solid)?		X		Benz(a)anthracene and benzo(k)fluoranthene were detected at estimated concentrations greater than the MDLs and less than the RLs in field duplicate STSMH2712-DUP and detected at concentrations greater than the RLs in sample STSMH2712, resulting in a noncalculable RPDs between the results. Therefore, the benz(a)anthracene and benzo(k)fluoranthene concentrations in the field duplicate pair were J qualified as estimated.
3. Were any data qualified based on the responses for this section?	X			

Comments:

- The following sample concentrations were flagged by the laboratory with "M-05", indicating estimated results due to peak separation for structural isomers being insufficient for accurate quantification; therefore, the benzo(k)fluoranthene, benz(a)anthracene, and chrysene concentrations in the associated samples were J flagged as estimated.
    - Benzo(k)fluoranthene concentrations in samples STSMH2712 collected on 4/1/2023 and STSMH2712 collected on 4/10/2023
    - Benz(a)anthracene concentration in sample STSMH2712 collected on 4/10/2023
    - Chrysene concentrations in samples STSMH2712 & STSMH2712-DUP collected on 4/10/2023

Sample ID	Compound	Laboratory Result (µg/L)	Laboratory Flag	Validation Result (µg/L)	Validation Qualifier	Reason Code
STSMH2712	Benz(a)anthracene	0.0188	M-05	0.0188	J	7
STSMH2712-DUP	Benz(a)anthracene	0.0153	J	0.0153	J	7
STSMH2712	Benzo(k)fluoranthene	0.0164	M-05	0.0164	J	7
STSMH2712-DUP	Benzo(k)fluoranthene	0.0137	J	0.0137	J	7

Sample ID	Compound	Laboratory Result (µg/L)	Laboratory Flag	Validation Result (µg/L)	Validation Qualifier	Reason Code
STSMH2712	Benzo(k)fluoranthene	0.0209	M-05	0.0209	J	13
STSMH2712	Benz(a)anthracene	0.0188	M-05	0.0188	J	13
STSMH2712	Benzo(k)fluoranthene	0.0164	M-05	0.0164	J	13
STSMH2712	Chrysene	0.024	M-05	0.024	J	13
STSMH2712-DUP	Chrysene	0.0217	M-05	0.0217	J	13

µg/L - Microgram per liter
M-05 – Laboratory flag indicating estimated results. Peak separation for structural isomers is insufficient for accurate quantification.

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - USEPA Method 8270E Semi-Volatiles Data Review

INSTRUCTIONS

1. Data shall be qualified using professional judgment along with the analytical method USEPA 8270E, the USEPA Contract Laboratory Program National Functional Guidelines for Organic Superfund Data Review, November 2020 (EPA 540-R-20-005).
2. Data qualifiers which will be applied to the data as applicable are as follows:
   U: The analyte was analyzed for, but was not detected at or above the reported sample quantitation limit. Upon application of the U qualifier to a reported result, the definition changes to "not detected at or above the reported result".
   J: The analyte was positively identified; the associated numerical value is an estimated concentration of the analyte in the sample.
   J-: The analyte was positively identified; the associated numerical value is an estimated concentration, the result may be biased low.
   J+: The analyte was positively identified; the associated numerical value is an estimated concentration, the result may be biased high.
   UJ: The analyte was not detected at or above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
   R: The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - USEPA Method 8270E Semi-Volatiles Data Review

ACRONYMS

CUL	Surface Water Cleanup Levels from Table 17 of the Portland Harbor Record of Decision (EPA, 2017).
EDD	Electronic Data Deliverable
ID	Identification
LCS	Laboratory Control Spike
MDL	Method Detection Limit
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NA	Not Applicable
QC	Quality Control
RL	Reporting Limit
RPD	Relative Percent Difference
USEPA	United States Environmental Protection Agency

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - USEPA Method 8270E Semi-Volatiles Data Review

DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits and RPD outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other
14	Lab flag removed; no validation qualification required

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - Completeness Review

Project: PNW0319AR- Port of Portland Terminal 4 Stormwater Sampling	Completed by: Anya Epstein	Reviewed by: Todd Olsen
Laboratory Report IDs/ Laboratory: A3D0709 and A3D01042/ Apex Laboratories, Tigard, OR	Date: 7/20/2023	Date: 7/31/2023

Item	***Yes***	***No***	***NA***	***Comments***
A. Completeness/Lab Receipt/Analysis				
1. Is the project name listed on COCs?	X			
2. Are the client IDs listed?	X			
3. IDs match those listed on COC and in the report?	X			
4. Are the sample collection date & time listed for each sample?	X			
5. Is the sample matrix listed?	X			
6. Is the sample preservation noted?			X	
7. Are the requested analyses noted?	X			
8. Were the samples properly relinquished and received?	X			
a. Proper documentation of dates and times?	X			
9. Date & time of lab receipt noted?	X			
10. Lab completed analyses for all samples collected?	X			
11. Sample receipt issues noted/described?			X	
12. Were any data qualified based on the responses for this section?		X		

Comments:

- Incorrect error corrections were observed on the COCs included in all reports, instead of the proper procedure of a single strike through, correction, and initials and date of person making the corrections.
- The 1613B samples were subcontracted to CERES Analytical Laboratory. The subcontracted laboratory reports were included as part of the in the Apex laboratory reports.

- Surrogates were reported as percent recovery in the laboratory report, but reported as concentrations in micrograms per liter in the EDDs for methods 8082, 1613B, and 8270E.

ACRONYMS

COC	Chain of Custody
ID	Identification
NA	Not applicable

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

Monday, February 12, 2024

Ariel Mosbrucker
Geosyntec Consultants, Inc
920 SW Sixth Avenue, Suite 600
Portland, OR 97204

RE: A4A1516 - POP - T4 Stormwater - PNW0524C

Thank you for using Apex Laboratories. We greatly appreciate your business and strive to provide the highest quality services to the environmental industry.

Enclosed are the results of analyses for work order A4A1516, which was received by the laboratory on 1/29/2024 at 9:21:00AM.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: DAuvil@apex-labs.com, or by phone at 503-718-2323.

Please note: All samples will be disposed of within 30 days of sample receipt, unless prior arrangements have been made.

Cooler Receipt Information
Acceptable Receipt Temperature is less than, or equal to, 6 degC (not frozen), or received on ice the same day as sampling.
(See Cooler Receipt Form for details)
Default Cooler 2.5 degC

This Final Report is the official version of the data results for this sample submission, unless superseded by a subsequent, labeled amended report.
All other deliverables derived from this data, including Electronic Data Deliverables (EDDs), CLP-like forms, client requested summary sheets, and all other products are considered secondary to this report.

Apex Laboratories

Darrell Auvil, Client Services Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document(s) and updated by any subsequent written communications. This analytical report must be reproduced in its entirety.

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

ANALYTICAL REPORT

Geosyntec Consultants, Inc	Project: POP - T4 Stormwater	
920 SW Sixth Avenue, Suite 600	Project Number: PNW0524C	Report ID:
Portland, OR 97204	Project Manager: Ariel Mosbrucker	A4A1516 - 02 12 24 1511

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
STSMH2710	A4A1516-01	Water	01/26/24 14:50	01/29/24 09:21
STSMH2603	A4A1516-02	Water	01/26/24 14:53	01/29/24 09:21
STSMH2615	A4A1516-03	Water	01/26/24 14:56	01/29/24 09:21
STSMH2615-DUP	A4A1516-04	Water	01/26/24 15:10	01/29/24 09:21
STSMH2712	A4A1516-05	Water	01/27/24 14:10	01/29/24 09:21
STSMH1914	A4A1516-06	Water	01/27/24 14:20	01/29/24 09:21

Apex Laboratories

Darrell Auvil, Client Services Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document(s) and updated by any subsequent written communications. This analytical report must be reproduced in its entirety.

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

ANALYTICAL REPORT

Geosyntec Consultants, Inc	Project: POP - T4 Stormwater	
920 SW Sixth Avenue, Suite 600	Project Number: PNW0524C	Report ID:
Portland, OR 97204	Project Manager: Ariel Mosbrucker	A4A1516 - 02 12 24 1511

ANALYTICAL SAMPLE RESULTS

Polychlorinated Biphenyls by EPA 8082A

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
STSMH1914 (A4A1516-06)				**Matrix: Water**		**Batch: 24B0262**		**C-09, DCNT**
Aroclor 1016	ND	0.0115	0.0230	ug/L	1	02/09/24 10:27	EPA 8082A	
Aroclor 1221	ND	0.0115	0.0230	ug/L	1	02/09/24 10:27	EPA 8082A	
Aroclor 1232	ND	0.0115	0.0230	ug/L	1	02/09/24 10:27	EPA 8082A	
Aroclor 1242	ND	0.0115	0.0230	ug/L	1	02/09/24 10:27	EPA 8082A	
Aroclor 1248	ND	0.0115	0.0230	ug/L	1	02/09/24 10:27	EPA 8082A	
Aroclor 1254	ND	0.0115	0.0230	ug/L	1	02/09/24 10:27	EPA 8082A	
Aroclor 1260	ND	0.0115	0.0230	ug/L	1	02/09/24 10:27	EPA 8082A	
Aroclor 1262	ND	0.0115	0.0230	ug/L	1	02/09/24 10:27	EPA 8082A	
Aroclor 1268	ND	0.0115	0.0230	ug/L	1	02/09/24 10:27	EPA 8082A	
Surrogate: Decachlorobiphenyl (Surr)		*Recovery: 75 %*		*Limits: 40-135 %*	*1*	*02/09/24 10:27*	*EPA 8082A*	

Apex Laboratories

The results in this report apply to the samples analyzed in accordance with the chain of custody document(s) and updated by any subsequent written communications. This analytical report must be reproduced in its entirety.

Darrell Auvil, Client Services Manager

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

ANALYTICAL REPORT

Geosyntec Consultants, Inc	Project: POP - T4 Stormwater	
920 SW Sixth Avenue, Suite 600	Project Number: PNW0524C	Report ID:
Portland, OR 97204	Project Manager: Ariel Mosbrucker	A4A1516 - 02 12 24 1511

ANALYTICAL SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
STSMH2712 (A4A1516-05)				**Matrix: Water**		**Batch: 24A0985**		
Acenaphthene	ND	0.0191	0.0381	ug/L	1	01/31/24 12:57	EPA 8270E LVI	
Acenaphthylene	ND	0.0191	0.0381	ug/L	1	01/31/24 12:57	EPA 8270E LVI	
Anthracene	ND	0.0191	0.0381	ug/L	1	01/31/24 12:57	EPA 8270E LVI	
Benz(a)anthracene	ND	0.00953	0.0191	ug/L	1	01/31/24 12:57	EPA 8270E LVI	
Benzo(a)pyrene	**0.0133**	0.00953	0.0191	ug/L	1	01/31/24 12:57	EPA 8270E LVI	**J**
Benzo(b)fluoranthene	**0.0219**	0.00953	0.0191	ug/L	1	01/31/24 12:57	EPA 8270E LVI	
Benzo(k)fluoranthene	ND	0.00953	0.0191	ug/L	1	01/31/24 12:57	EPA 8270E LVI	
Benzo(g,h,i)perylene	ND	0.0191	0.0381	ug/L	1	01/31/24 12:57	EPA 8270E LVI	
Chrysene	**0.0124**	0.00953	0.0191	ug/L	1	01/31/24 12:57	EPA 8270E LVI	**J**
Dibenz(a,h)anthracene	ND	0.00953	0.0191	ug/L	1	01/31/24 12:57	EPA 8270E LVI	
Fluoranthene	**0.0214**	0.0191	0.0381	ug/L	1	01/31/24 12:57	EPA 8270E LVI	**J**
Fluorene	ND	0.0191	0.0381	ug/L	1	01/31/24 12:57	EPA 8270E LVI	
Indeno(1,2,3-cd)pyrene	**0.0143**	0.00953	0.0191	ug/L	1	01/31/24 12:57	EPA 8270E LVI	**J**
2-Methylnaphthalene	ND	0.0381	0.0762	ug/L	1	01/31/24 12:57	EPA 8270E LVI	
Naphthalene	ND	0.0381	0.0762	ug/L	1	01/31/24 12:57	EPA 8270E LVI	
Phenanthrene	ND	0.0381	0.0762	ug/L	1	01/31/24 12:57	EPA 8270E LVI	
Pyrene	**0.0238**	0.0191	0.0381	ug/L	1	01/31/24 12:57	EPA 8270E LVI	**J**
Surrogate: Acenaphthylene-d8 (Surr)		*Recovery:*	*110 %*	*Limits:*	*78-134 %*	*01/31/24 12:57*	*EPA 8270E LVI*	
Benzo(a)pyrene-d12 (Surr)			*117 %*		*80-132 %*	*01/31/24 12:57*	*EPA 8270E LVI*	

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Darrell Auvil, Client Services Manager

Apex Laboratories, LLC
6700 S.W. Sandburg Street
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503-718-2323
ORELAP ID: OR100062

ANALYTICAL REPORT

Geosyntec Consultants, Inc	Project: POP - T4 Stormwater	
920 SW Sixth Avenue, Suite 600	Project Number: PNW0524C	Report ID:
Portland, OR 97204	Project Manager: Ariel Mosbrucker	A4A1516 - 02 12 24 1511

ANALYTICAL SAMPLE RESULTS

Solid and Moisture Determinations

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
STSMH2710 (A4A1516-01)				**Matrix: Water**				
Batch: 24A0938								
Total Suspended Solids	**13.0**	---	5.00	mg/L	1	01/30/24 14:50	SM 2540 D	**CONT,TSS**
STSMH2603 (A4A1516-02)				**Matrix: Water**				
Batch: 24A0938								
Total Suspended Solids	**6.00**	---	5.00	mg/L	1	01/30/24 14:50	SM 2540 D	**CONT,TSS**
STSMH2615 (A4A1516-03)				**Matrix: Water**				
Batch: 24A0938								
Total Suspended Solids	**8.00**	---	5.00	mg/L	1	01/30/24 14:50	SM 2540 D	**CONT,TSS**
STSMH2615-DUP (A4A1516-04)				**Matrix: Water**				
Batch: 24A0938								
Total Suspended Solids	**12.0**	---	5.00	mg/L	1	01/30/24 14:50	SM 2540 D	**CONT,TSS**
STSMH2712 (A4A1516-05)				**Matrix: Water**				
Batch: 24B0056								
Total Suspended Solids	**6.00**	---	5.00	mg/L	1	02/05/24 14:15	SM 2540 D	**TSS**
STSMH1914 (A4A1516-06)				**Matrix: Water**				
Batch: 24B0056								
Total Suspended Solids	**242**	---	10.0	mg/L	1	02/05/24 14:15	SM 2540 D	

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ORELAP ID: **OR100062**

Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0524C**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A4A1516 - 02 12 24 1511**

QUALITY CONTROL (QC) SAMPLE RESULTS

Polychlorinated Biphenyls by EPA 8082A

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 24B0262 - EPA 3510C (Neutral pH)							**Water**					
Blank (24B0262-BLK1)			Prepared: 02/08/24 06:06		Analyzed: 02/09/24 09:34							**C-09**
EPA 8082A												
Aroclor 1016	ND	0.0100	0.0200	ug/L	1	---	---	---	---	---	---	
Aroclor 1221	ND	0.0100	0.0200	ug/L	1	---	---	---	---	---	---	
Aroclor 1232	ND	0.0100	0.0200	ug/L	1	---	---	---	---	---	---	
Aroclor 1242	ND	0.0100	0.0200	ug/L	1	---	---	---	---	---	---	
Aroclor 1248	ND	0.0100	0.0200	ug/L	1	---	---	---	---	---	---	
Aroclor 1254	ND	0.0100	0.0200	ug/L	1	---	---	---	---	---	---	
Aroclor 1260	ND	0.0100	0.0200	ug/L	1	---	---	---	---	---	---	
Aroclor 1262	ND	0.0100	0.0200	ug/L	1	---	---	---	---	---	---	
Aroclor 1268	ND	0.0100	0.0200	ug/L	1	---	---	---	---	---	---	
Surr: Decachlorobiphenyl (Surr)			*Recovery: 79 %*		*Limits: 40-135 %*				*Dilution: 1x*			
LCS (24B0262-BS1)			Prepared: 02/08/24 06:06		Analyzed: 02/09/24 09:52							**C-09**
EPA 8082A												
Aroclor 1016	0.728	0.0100	0.0200	ug/L	1	1.25	---	58	46-129%	---	---	
Aroclor 1260	0.949	0.0100	0.0200	ug/L	1	1.25	---	76	45-134%	---	---	
Surr: Decachlorobiphenyl (Surr)			*Recovery: 73 %*		*Limits: 40-135 %*				*Dilution: 1x*			
LCS Dup (24B0262-BSD1)			Prepared: 02/08/24 06:06		Analyzed: 02/09/24 10:10							**C-09, Q-19**
EPA 8082A												
Aroclor 1016	0.747	0.0100	0.0200	ug/L	1	1.25	---	60	46-129%	3	30%	
Aroclor 1260	0.980	0.0100	0.0200	ug/L	1	1.25	---	78	45-134%	3	30%	
Surr: Decachlorobiphenyl (Surr)			*Recovery: 78 %*		*Limits: 40-135 %*				*Dilution: 1x*			

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ORELAP ID: **OR100062**

Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0524C**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A4A1516 - 02 12 24 1511**

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 24A0985 - EPA 3511 (Bottle Extraction)							**Water**					
Blank (24A0985-BLK1)			Prepared: 01/31/24 07:37		Analyzed: 01/31/24 10:15							
EPA 8270E LVI												
Acenaphthene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Acenaphthylene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Anthracene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Benz(a)anthracene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Benzo(a)pyrene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Benzo(b)fluoranthene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Benzo(k)fluoranthene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Benzo(g,h,i)perylene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Chrysene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Dibenz(a,h)anthracene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
Fluoranthene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Fluorene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Indeno(1,2,3-cd)pyrene	ND	0.00800	0.0160	ug/L	1	---	---	---	---	---	---	
1-Methylnaphthalene	ND	0.0320	0.0640	ug/L	1	---	---	---	---	---	---	
2-Methylnaphthalene	ND	0.0320	0.0640	ug/L	1	---	---	---	---	---	---	
Naphthalene	ND	0.0320	0.0640	ug/L	1	---	---	---	---	---	---	
Phenanthrene	ND	0.0320	0.0640	ug/L	1	---	---	---	---	---	---	
Pyrene	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Carbazole	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Dibenzofuran	ND	0.0160	0.0320	ug/L	1	---	---	---	---	---	---	
Surr: Acenaphthylene-d8 (Surr)			*Recovery: 105 %*		*Limits: 78-134 %*				*Dilution: 1x*			
Benzo(a)pyrene-d12 (Surr)			*117 %*		*80-132 %*				*"*			
LCS (24A0985-BS1)			Prepared: 01/31/24 07:37		Analyzed: 01/31/24 10:47							
EPA 8270E LVI												
Acenaphthene	1.50	0.0160	0.0320	ug/L	1	1.60	---	94	80-120%	---	---	
Acenaphthylene	1.58	0.0160	0.0320	ug/L	1	1.60	---	99	80-124%	---	---	
Anthracene	1.58	0.0160	0.0320	ug/L	1	1.60	---	99	80-123%	---	---	
Benz(a)anthracene	1.65	0.00800	0.0160	ug/L	1	1.60	---	103	80-122%	---	---	
Benzo(a)pyrene	1.76	0.00800	0.0160	ug/L	1	1.60	---	110	80-129%	---	---	
Benzo(b)fluoranthene	1.64	0.00800	0.0160	ug/L	1	1.60	---	102	80-124%	---	---	
Benzo(k)fluoranthene	1.68	0.00800	0.0160	ug/L	1	1.60	---	105	80-125%	---	---	
Benzo(g,h,i)perylene	1.55	0.0160	0.0320	ug/L	1	1.60	---	97	80-120%	---	---	

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ORELAP ID: **OR100062**

Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0524C**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A4A1516 - 02 12 24 1511**

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 24A0985 - EPA 3511 (Bottle Extraction)							**Water**					
LCS (24A0985-BS1)			Prepared: 01/31/24 07:37		Analyzed: 01/31/24 10:47							
Chrysene	1.57	0.00800	0.0160	ug/L	1	1.60	---	98	80-120%	---	---	
Dibenz(a,h)anthracene	1.54	0.00800	0.0160	ug/L	1	1.60	---	96	80-120%	---	---	
Fluoranthene	1.89	0.0160	0.0320	ug/L	1	1.60	---	118	80-126%	---	---	
Fluorene	1.65	0.0160	0.0320	ug/L	1	1.60	---	103	77-127%	---	---	
Indeno(1,2,3-cd)pyrene	1.47	0.00800	0.0160	ug/L	1	1.60	---	92	80-121%	---	---	
1-Methylnaphthalene	1.77	0.0320	0.0640	ug/L	1	1.60	---	111	53-148%	---	---	
2-Methylnaphthalene	1.68	0.0320	0.0640	ug/L	1	1.60	---	105	48-150%	---	---	
Naphthalene	1.47	0.0320	0.0640	ug/L	1	1.60	---	92	78-120%	---	---	
Phenanthrene	1.47	0.0320	0.0640	ug/L	1	1.60	---	92	80-120%	---	---	
Pyrene	1.89	0.0160	0.0320	ug/L	1	1.60	---	118	80-125%	---	---	
Carbazole	1.79	0.0160	0.0320	ug/L	1	1.60	---	112	65-141%	---	---	
Dibenzofuran	1.50	0.0160	0.0320	ug/L	1	1.60	---	94	76-121%	---	---	
Surr: Acenaphthylene-d8 (Surr)			*Recovery: 109 %*		*Limits: 78-134 %*				*Dilution: 1x*			
Benzo(a)pyrene-d12 (Surr)			*117 %*		*80-132 %*				*"*			
LCS Dup (24A0985-BSD1)			Prepared: 01/31/24 07:37		Analyzed: 01/31/24 11:20							**Q-19**
EPA 8270E LVI												
Acenaphthene	1.52	0.0160	0.0320	ug/L	1	1.60	---	95	80-120%	1	30%	
Acenaphthylene	1.57	0.0160	0.0320	ug/L	1	1.60	---	98	80-124%	1	30%	
Anthracene	1.61	0.0160	0.0320	ug/L	1	1.60	---	101	80-123%	2	30%	
Benz(a)anthracene	1.61	0.00800	0.0160	ug/L	1	1.60	---	100	80-122%	3	30%	
Benzo(a)pyrene	1.77	0.00800	0.0160	ug/L	1	1.60	---	111	80-129%	0.5	30%	
Benzo(b)fluoranthene	1.68	0.00800	0.0160	ug/L	1	1.60	---	105	80-124%	3	30%	
Benzo(k)fluoranthene	1.68	0.00800	0.0160	ug/L	1	1.60	---	105	80-125%	0.5	30%	
Benzo(g,h,i)perylene	1.57	0.0160	0.0320	ug/L	1	1.60	---	98	80-120%	1	30%	
Chrysene	1.56	0.00800	0.0160	ug/L	1	1.60	---	97	80-120%	0.4	30%	
Dibenz(a,h)anthracene	1.54	0.00800	0.0160	ug/L	1	1.60	---	96	80-120%	0.1	30%	
Fluoranthene	1.90	0.0160	0.0320	ug/L	1	1.60	---	119	80-126%	0.8	30%	
Fluorene	1.66	0.0160	0.0320	ug/L	1	1.60	---	104	77-127%	0.6	30%	
Indeno(1,2,3-cd)pyrene	1.47	0.00800	0.0160	ug/L	1	1.60	---	92	80-121%	0.03	30%	
1-Methylnaphthalene	1.79	0.0320	0.0640	ug/L	1	1.60	---	112	53-148%	1	30%	
2-Methylnaphthalene	1.70	0.0320	0.0640	ug/L	1	1.60	---	106	48-150%	1	30%	
Naphthalene	1.49	0.0320	0.0640	ug/L	1	1.60	---	93	78-120%	1	30%	
Phenanthrene	1.49	0.0320	0.0640	ug/L	1	1.60	---	93	80-120%	1	30%	

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ORELAP ID: **OR100062**

Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0524C**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A4A1516 - 02 12 24 1511**

QUALITY CONTROL (QC) SAMPLE RESULTS

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 24A0985 - EPA 3511 (Bottle Extraction)							**Water**					
LCS Dup (24A0985-BSD1)			Prepared: 01/31/24 07:37		Analyzed: 01/31/24 11:20							**Q-19**
Pyrene	1.90	0.0160	0.0320	ug/L	1	1.60	---	119	80-125%	0.4	30%	
Carbazole	1.80	0.0160	0.0320	ug/L	1	1.60	---	112	65-141%	0.3	30%	
Dibenzofuran	1.51	0.0160	0.0320	ug/L	1	1.60	---	95	76-121%	1	30%	
Surr: Acenaphthylene-d8 (Surr)			*Recovery: 108 %*		*Limits: 78-134 %*				*Dilution: 1x*			
Benzo(a)pyrene-d12 (Surr)			*118 %*		*80-132 %*				*"*			

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Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0524C**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A4A1516 - 02 12 24 1511**

QUALITY CONTROL (QC) SAMPLE RESULTS

Solid and Moisture Determinations

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 24A0938 - Total Suspended Solids - 2022												**Water**
Blank (24A0938-BLK1)			Prepared: 01/30/24 12:33		Analyzed: 01/30/24 14:50							
SM 2540 D												
Total Suspended Solids	ND	---	5.00	mg/L	1	---	---	---	---	---	---	
Duplicate (24A0938-DUP1)			Prepared: 01/30/24 12:33		Analyzed: 01/30/24 14:50							
QC Source Sample: Non-SDG (A4A1442-05)												
Total Suspended Solids	ND	---	5.00	mg/L	1	---	ND	---	---	---	10%	TSS
Duplicate (24A0938-DUP2)			Prepared: 01/30/24 12:33		Analyzed: 01/30/24 14:50							
QC Source Sample: Non-SDG (A4A1501-02)												
Total Suspended Solids	**17.0**	---	5.00	mg/L	1	---	9.00	---	---	**61.5**	**10%**	Q-05, TSS
Reference (24A0938-SRM1)			Prepared: 01/30/24 12:33		Analyzed: 01/30/24 14:50							
SM 2540 D												
Total Suspended Solids	819	---		mg/L	1	928		88.3	85-115%	---	---	

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ANALYTICAL REPORT

Geosyntec Consultants, Inc	Project:	POP - T4 Stormwater
920 SW Sixth Avenue, Suite 600	Project Number:	PNW0524C
Portland, OR 97204	Project Manager:	Ariel Mosbrucker
		Report ID: A4A1516 - 02 12 24 1511

QUALITY CONTROL (QC) SAMPLE RESULTS

Solid and Moisture Determinations

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 24B0056 - Total Suspended Solids - 2022									Water			
Blank (24B0056-BLK1)			Prepared: 02/02/24 14:05		Analyzed: 02/05/24 14:15							
SM 2540 D												
Total Suspended Solids	ND	---	5.00	mg/L	1	---	---	---	---	---	---	
Duplicate (24B0056-DUP1)			Prepared: 02/02/24 14:05		Analyzed: 02/05/24 14:15							
QC Source Sample: Non-SDG (A4A1500-02)												
Total Suspended Solids	ND	---	5.00	mg/L	1	---	ND	---	---	---	10%	TSS
Duplicate (24B0056-DUP2)			Prepared: 02/02/24 14:05		Analyzed: 02/05/24 14:15							
QC Source Sample: Non-SDG (A4A1559-01)												
Total Suspended Solids	**214**	---	10.0	mg/L	1	---	216	---	---	0.930	10%	
Reference (24B0056-SRM1)			Prepared: 02/02/24 14:05		Analyzed: 02/05/24 14:15							
SM 2540 D												
Total Suspended Solids	911	---		mg/L	1	928		98.2	85-115%	---	---	

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Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

ANALYTICAL REPORT

Geosyntec Consultants, Inc	Project: POP - T4 Stormwater	
920 SW Sixth Avenue, Suite 600	Project Number: PNW0524C	Report ID:
Portland, OR 97204	Project Manager: Ariel Mosbrucker	A4A1516 - 02 12 24 1511

SAMPLE PREPARATION INFORMATION

Polychlorinated Biphenyls by EPA 8082A

Prep: EPA 3510C (Neutral pH)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 24B0262							
A4A1516-06	Water	EPA 8082A	01/27/24 14:20	02/08/24 06:06	870mL/1mL	1000mL/1mL	1.15

Polyaromatic Hydrocarbons (PAHs) by EPA 8270E (Large Volume Injection)

Prep: EPA 3511 (Bottle Extraction)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 24A0985							
A4A1516-05	Water	EPA 8270E LVI	01/27/24 14:10	01/31/24 07:37	104.93mL/5mL	125mL/5mL	1.19

Solid and Moisture Determinations

Prep: Total Suspended Solids - 2022

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 24A0938							
A4A1516-01	Water	SM 2540 D	01/26/24 14:50	01/30/24 12:33			NA
A4A1516-02	Water	SM 2540 D	01/26/24 14:53	01/30/24 12:33			NA
A4A1516-03	Water	SM 2540 D	01/26/24 14:56	01/30/24 12:33			NA
A4A1516-04	Water	SM 2540 D	01/26/24 15:10	01/30/24 12:33			NA
Batch: 24B0056							
A4A1516-05	Water	SM 2540 D	01/27/24 14:10	02/02/24 14:05			NA
A4A1516-06	Water	SM 2540 D	01/27/24 14:20	02/02/24 14:05			NA

Apex Laboratories

Darrell Auvil, Client Services Manager

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ANALYTICAL REPORT

Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0524C**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A4A1516 - 02 12 24 1511**

QUALIFIER DEFINITIONS

Client Sample and Quality Control (QC) Sample Qualifier Definitions:

Apex Laboratories

C-09	Extract has undergone Sulfuric Acid Cleanup by EPA 3665A and Florisil Cleanup by EPA 3620B in order to minimize matrix interference.
CONT	The Sample Container provided for this analysis was not provided by Apex Laboratories, and has not been verified as part of the Apex Quality System.
DCNT	Sample decanted due to the presence of sediment. Sample bottle not rinsed with solvent.
J	Estimated Result. Result detected below the lowest point of the calibration curve, but above the specified MDL.
Q-05	Analyses are not controlled on RPD values from sample and duplicate concentrations that are below 5 times the reporting level.
Q-19	Blank Spike Duplicate (BSD) sample analyzed in place of Matrix Spike/Duplicate samples due to limited sample amount available for analysis.
TSS	Dried residue was less than 2.5mg as specified in the method. Results meet regulatory requirements.

Apex Laboratories

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ANALYTICAL REPORT

Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0524C**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A4A1516 - 02 12 24 1511**

REPORTING NOTES AND CONVENTIONS:

Abbreviations:

DET Analyte DETECTED at or above the detection or reporting limit.

ND Analyte NOT DETECTED at or above the detection or reporting limit.

NR Result Not Reported

RPD Relative Percent Difference. RPDs for Matrix Spikes and Matrix Spike Duplicates are based on concentration, not recovery.

Detection Limits: Limit of Detection (LOD)

Limits of Detection (LODs) are normally set at a level of one half the validated Limit of Quantitation (LOQ).
If no value is listed ('-----'), then the data has not been evaluated below the Reporting Limit.

Reporting Limits: Limit of Quantitation (LOQ)

Validated Limits of Quantitation (LOQs) are reported as the Reporting Limits for all analyses where the LOQ, MRL, PQL or CRL are requested. The LOQ represents a level at or above the low point of the calibration curve, that has been validated according to Apex Laboratories' comprehensive LOQ policies and procedures.

Reporting Conventions:

Basis: Results for soil samples are generally reported on a 100% dry weight basis.
The Result Basis is listed following the units as " dry", " wet", or " " (blank) designation.

" dry" Sample results and Reporting Limits are reported on a dry weight basis. (i.e. "ug/kg dry")
See Percent Solids section for details of dry weight analysis.

" wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected, but have not been modified in this case.

" " Results without 'wet' or 'dry' designation are not normally dry weight corrected. These results are considered 'As Received'.

Results for Volatiles analyses on soils and sediments that are reported on a “dry weight” basis include the water miscible solvent (WMS) correction referenced in the EPA 8000 Method guidance documents. Solid and Liquid samples reported on an “As Received” basis do not have the WMS correction applied, as dry weight was not performed.

QC Source:

In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) may be analyzed to demonstrate accuracy and precision of the extraction batch.

Non-Client Batch QC Samples (Duplicates and Matrix Spike/Duplicates) may not be included in this report. Please request a Full QC report if this data is required.

Miscellaneous Notes:

" --- " QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

" *** " Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Apex Laboratories

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Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0524C**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A4A1516 - 02 12 24 1511**

REPORTING NOTES AND CONVENTIONS (Cont.):

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to ½ the Reporting Limit (RL).

-For Blank hits falling between ½ the RL and the RL (J flagged hits), the associated sample and QC data will receive a 'B-02' qualifier.

-For Blank hits above the RL, the associated sample and QC data will receive a 'B' qualifier, per Apex Laboratories' Blank Policy.
For further details, please request a copy of this document.

-Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the sample results are less than ten times the level found in the blank for inorganic analyses, or less than five times the level found in the blank for organic analyses.

'B' and 'B-02' qualifications are only applied to sample results detected above the Reporting Level, if results are not reported to the MDL.

Preparation Notes:

Mixed Matrix Samples:

Water Samples:

Water samples containing significant amounts of sediment are decanted or separated prior to extraction, and only the water portion analyzed, unless otherwise directed by the client.

Soil and Sediment Samples:

Soil and Sediment samples containing significant amounts of water are decanted prior to extraction, and only the solid portion analyzed, unless otherwise directed by the client.

Sampling and Preservation Notes:

Certain regulatory programs, such as National Pollutant Discharge Elimination System (NPDES), require that activities such as sample filtration (for dissolved metals, orthophosphate, hexavalent chromium, etc.) and testing of short hold analytes (pH, Dissolved Oxygen, etc.) be performed in the field (on-site) within a short time window. In addition, sample matrix spikes are required for some analyses, and sufficient volume must be provided, and billable site specific QC requested, if this is required. All regulatory permits should be reviewed to ensure that these requirements are being met.

Data users should be aware of which regulations pertain to the samples they submit for testing. If related sample collection activities are not approved for a particular regulatory program, results should be considered estimates. Apex Laboratories will qualify these analytes according to the most stringent requirements, however results for samples that are for non-regulatory purposes may be acceptable.

Samples that have been filtered and preserved at Apex Laboratories per client request are listed in the preparation section of the report with the date and time of filtration listed.

Apex Laboratories maintains detailed records on sample receipt, including client label verification, cooler temperature, sample preservation, hold time compliance and field filtration. Data is qualified as necessary, and the lack of qualification indicates compliance with required parameters.

Apex Laboratories

Darrell Auvil, Client Services Manager

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ANALYTICAL REPORT

Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0524C**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A4A1516 - 02 12 24 1511**

LABORATORY ACCREDITATION INFORMATION

ORELAP Certification ID: OR100062 (Primary Accreditation) - EPA ID: OR01039

All methods and analytes reported from work performed at Apex Laboratories are included on Apex Laboratories' ORELAP Scope of Certification, with the exception of any analyte(s) listed below:

Apex Laboratories

Matrix	Analysis	TNI_ID	Analyte	TNI_ID	Accreditation

All reported analytes are included in Apex Laboratories' current ORELAP scope.

Secondary Accreditations

Apex Laboratories also maintains reciprocal accreditation with non-TNI states (Washington DOE), as well as other state specific accreditations not listed here.

Subcontract Laboratory Accreditations

Subcontracted data falls outside of Apex Laboratories' Scope of Accreditation.
Please see the Subcontract Laboratory report for full details, or contact your Project Manager for more information.

Field Testing Parameters

Results for Field Tested data are provded by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

Apex Laboratories

Darrell Auvil, Client Services Manager

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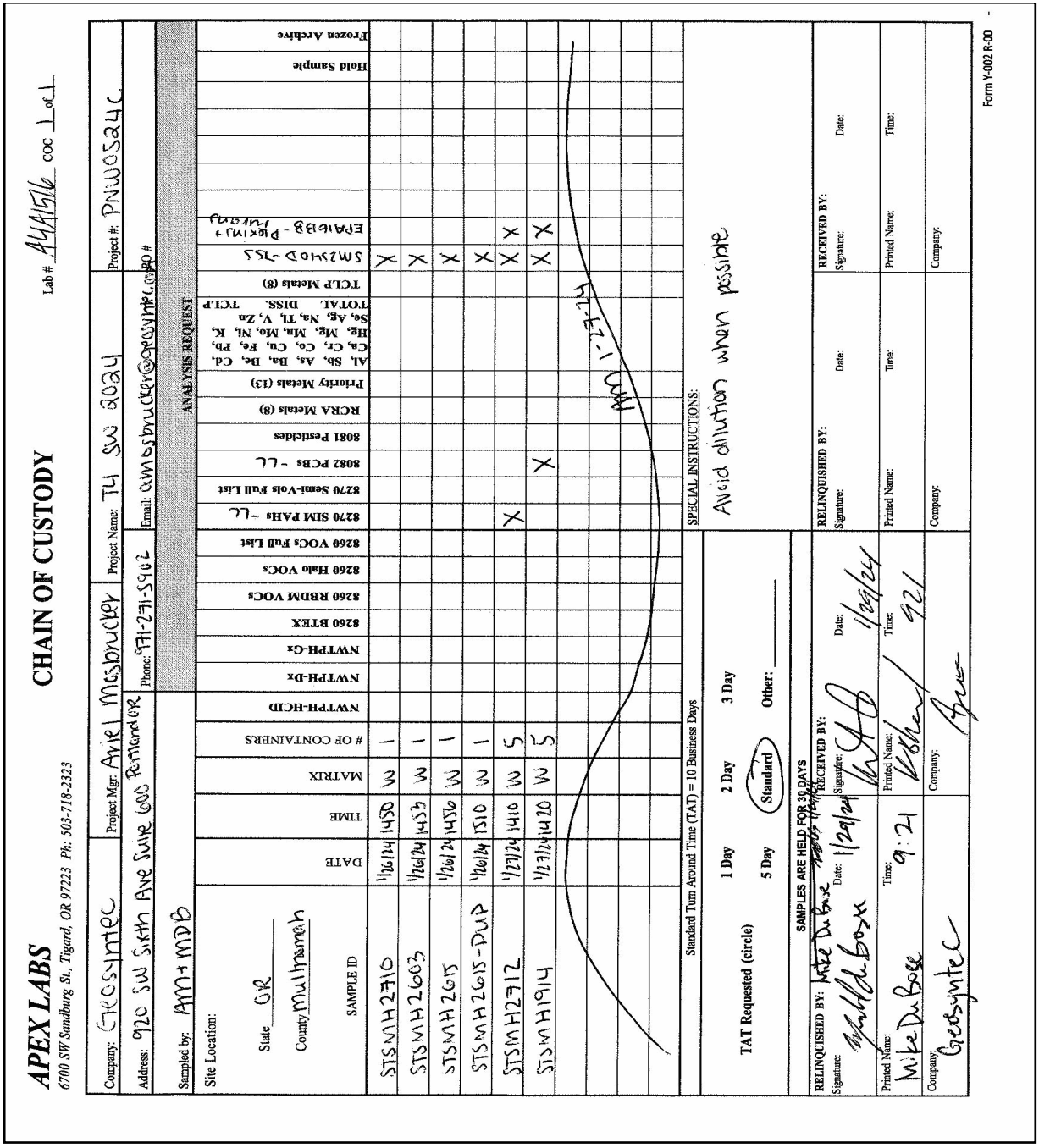

APEX LABS — **CHAIN OF CUSTODY** — Lab # APEX — COC 1 of 1

6700 SW Sandburg St., Tigard, OR 97223 Ph: 503-718-2323

Company: Geosyntec | Project Mgr: Ariel Mosbrucker | Project Name: T4 SW 2024 | Project #: PNW0524C

Address: 920 SW Sixth Ave Suite 600 Portland OR | Phone: 971-271-5902 | Email: amosbrucker@geosyntec.com | PO #

Sampled by: AMM+MDB

Site Location: State OR County Multnomah

SAMPLE ID	DATE	TIME	MATRIX	# OF CONTAINERS	NWTPH-HCID	NWTPH-Dx	NWTPH-Gx	8260 BTEX	8260 RBDM VOCs	8260 Halo VOCs	8260 VOCs Full List	8270 SIM PAHs - LL	8270 Semi-Vols Full List	8082 PCBs - LL	8081 Pesticides	RCRA Metals (8)	Priority Metals (13)	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Hg, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Tl, V, Zn TOTAL DISS. TCLP	TCLP Metals (8)	SM2540D - TSS	EPA1631E - Filtered + Preserved	Hold Sample	Frozen Archive
STSMH2710	1/26/24	1450	W	1															X			
STSMH2603	1/26/24	1453	W	1															X			
STSMH2615	1/26/24	1436	W	1															X			
STSMH2615-DUP	1/26/24	1510	W	1															X			
STSMH2712	1/27/24	1410	W	5								X						X	X			
STSMH1914	1/27/24	1420	W	5									X					X	X			

Standard Turn Around Time (TAT) = 10 Business Days

TAT Requested (circle): 1 Day | 2 Day | 3 Day | 5 Day | Standard | Other: _____

SPECIAL INSTRUCTIONS: Avoid dilution when possible

SAMPLES ARE HELD FOR 30 DAYS

RELINQUISHED BY: Signature: Date: 1/29/24 Time: 9:21 Printed Name: Mike DuBose Company: Geosyntec

RECEIVED BY: Signature: Date: 1/29/24 Time: 921 Printed Name: Date: Time: Company:

RELINQUISHED BY: Signature: Date: Time: Printed Name: Company:

RECEIVED BY: Signature: Date: Time: Printed Name: Company:

Form Y-002 R-00

Apex Laboratories

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ANALYTICAL REPORT

Geosyntec Consultants, Inc	Project: **POP - T4 Stormwater**	
920 SW Sixth Avenue, Suite 600	Project Number: **PNW0524C**	**Report ID:**
Portland, OR 97204	Project Manager: **Ariel Mosbrucker**	**A4A1516 - 02 12 24 1511**

APEX LABS COOLER RECEIPT FORM

Client: Geosyntec Element WO#: A4 A1516

Project/Project #: T4 SW 2024 PNW0524C
ARC for KPB 1/29/24

Delivery Info:

Date/time received: 1/24/24 @ 921 By: MO

Delivered by: Apex__Client X ESS__FedEx__UPS__Radio__Morgan__SDS__Evergreen__Other__

Cooler Inspection Date/time inspected: 1/29/24 @ 921 By: MS

Chain of Custody included? Yes X No ____

Signed/dated by client? Yes X No ____

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (°C)	2.5						
Custody seals? (Y/N)	N						
Received on ice? (Y/N)	Y						
Temp. blanks? (Y/N)	Y						
Ice type: (Gel/Real/Other)	Real						
Condition (In/Out):	In						

Cooler out of temp? (Y/N) Possible reason why: ____

Green dots applied to out of temperature samples? Yes/No

Out of temperature samples form initiated? Yes/No

Sample Inspection: Date/time inspected: 1/29/24 @ 937 By: MS

All samples intact? Yes X No ___ Comments: ____

Bottle labels/COCs agree? Yes X No ___ Comments: ____

COC/container discrepancies form initiated? Yes ___ No X

Containers/volumes received appropriate for analysis? Yes X No ___ Comments: ____

Do VOA vials have visible headspace? Yes ___ No ___ NA X

Comments ____

Water samples: pH checked: Yes___No___NA X pH appropriate? Yes___No___NA X pH ID: ____

Comments: ____

Additional information: ____

Labeled by: Witness: Cooler Inspected by:

Form Y-003 R-01

Apex Laboratories

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Darrell Auvil, Client Services Manager

CERES Analytical Laboratory, Inc.
4919 Windplay Dr. Suite 1, El Dorado Hills, CA 95762

February 6, 2024 Ceres ID: 17474

Apex Laboratories
6700 S.W. Sandburg Street
Tigard, OR 97223

The following report contains the results for the two aqueous samples received on January 31, 2024. These samples were analyzed for tetra through octa chlorinated dioxins and dibenzofurans by EPA method 1613. Standard 2-week turn-around time was provided for this work.

This work was authorized under Apex Laboratories' Project # A4A1516.

Continuing Calibration Verification (CCV) Requirements
All associated calibration verification standard(s) (CCV) met the acceptance criteria.

The report consists of a Cover Letter, Sample Inventory (Section I), Data Summary (Section II), Sample Tracking (Section VI), and Qualifiers/Abbreviations (Section VII). Raw Data (Section III), Continuing Calibration (Section IV), and Initial Calibration (Section V) are available in a full report (.pdf format) upon request.

If you have any questions regarding this report, please feel free to contact me at (916)932-5011.

Sincerely,

James M. Hedin
Director of Operations/CEO
jhedin@ceres-lab.com

Section I: Sample Inventory

Ceres Sample ID:	Sample ID	Date Received	Collection Date	&Time
17474-001	STSMH2712 (A4A1516-05)	1/31/2024	1/27/2024	14:10
17474-002	STSMH1914 (A4A1516-06)	1/31/2024	1/27/2024	14:20

Section II: Data Summary

CERES Analytical Laboratory, Inc.
4919 Windplay Dr.Suite 1, El Dorado Hills, CA 95762

EPA Method 1613

Quality Assurance Sample Method Blank		Date Received: NA
	QC Batch #: 3072	Date Extracted: 2/4/2024
	Matrix: Aqueous	Date Analyzed: 2/5/2024
Project ID: A4A1516	Sample Size: 1.000 L	

Analyte	Conc. (pg/L)	MDL	RL	Qual.	Labeled Standards	% R	LCL-UCL (a)	Qualifiers
2,3,7,8-TCDD	ND< 1.56	2.96	5.00		13C-2378-TCDD	77.5	25-164	
12378-PeCDD	ND< 6.21	8.39	25.0		13C-12378-PeCDD	90.1	25-181	
123478-HxCDD	ND< 5.61	16.6	25.0		13C-123478-HxCDD	65.6	32-141	
123678-HxCDD	ND< 4.78	9.38	25.0		13C-123678-HxCDD	70.6	28-130	
123789-HxCDD	ND< 5.54	9.18	25.0		13C-1234678-HpCDD	65.9	23-140	
1234678-HpCDD	ND< 5.53	7.31	25.0		13C-OCDD	95.6	17-157	
OCDD	ND< 9.77	22.2	50.0		13C-2378-TCDF	65.2	24-169	
2,3,7,8-TCDF	ND< 3.07	1.44	5.00		13C-12378-PeCDF	99.7	24-185	
12378-PeCDF	ND< 8.02	6.86	25.0		13C-23478-PeCDF	99.5	21-178	
23478-PeCDF	ND< 7.57	5.95	25.0		13C-123478-HxCDF	93.9	26-152	
123478-HxCDF	ND< 3.98	8.38	25.0		13C-123678-HxCDF	93.0	26-123	
123678-HxCDF	ND< 3.72	8.04	25.0		13C-234678-HxCDF	90.7	28-136	
234678-HxCDF	ND< 4.75	6.88	25.0		13C-123789-HxCDF	81.4	29-147	
123789-HxCDF	ND< 7.95	7.81	25.0		13C-1234678-HpCDF	75.4	28-143	
1234678-HpCDF	ND< 4.34	7.73	25.0		13C-1234789-HpCDF	73.9	26-138	
1234789-HpCDF	ND< 6.45	7.07	25.0					
OCDF	ND< 9.05	9.32	50.0					

Totals	Conc. (pg/L)	EMPC
Total TCDD	ND< 1.56	
Total PeCDD	ND< 6.21	
Total HxCDD	ND< 5.61	
Total HpCDD	ND< 5.53	
Total TCDF	ND< 3.07	
Total PeCDF	ND< 8.02	
Total HxCDF	ND< 7.95	
Total HpCDF	ND< 6.45	

CRS

37Cl4-2378-TCDD	91.1	35-197	

DL - Signifies Non-Detect (ND<) sample specific detection limit.
EMPC - Estimated Maximum Possible Concentration due to ion abundance ratio failure.
(a) - Lower control limit - Upper control limit
(b) - TEQ based on (2005) World Health Organization (WHO) Toxic Equivalent Factors.

Total Toxic Equivalency (TEQ min.) (b)**:** 0.0 pg/L

Analyst: JMH **Reviewed by: BS**

CERES Analytical Laboratory, Inc.
4919 Windplay Dr. Suite 1, El Dorado Hills, CA 95762

EPA Method 1613

Quality Assurance Sample Ongoing Precision and Recovery		Date Received: NA
	QC Batch #: 3072	Date Extracted: 2/4/2024
	Matrix: Aqueous	Date Analyzed: 2/5/2024
Project ID: A4A1516	Sample Size: 1.000 L	

Analyte	Conc. (ng/mL)	Limits (a)	Labeled Standards	% Rec.	Limits (a)
2,3,7,8-TCDD	9.02	6.7-15.8	13C-2378-TCDD	72.8	20-175
12378-PeCDD	54.1	35-71	13C-12378-PeCDD	105	21-227
123478-HxCDD	46.5	35-82	13C-123478-HxCDD	62.9	21-193
123678-HxCDD	56.0	38-67	13C-123678-HxCDD	70.8	25-163
123789-HxCDD	45.9	32-81	13C-1234678-HpCDD	62.6	26-166
1234678-HpCDD	57.7	35-70	13C-OCDD	105	13-198
OCDD	97.1	78-144	13C-2378-TCDF	61.1	22-152
2,3,7,8-TCDF	10.1	7.5-15.8	13C-12378-PeCDF	92.8	21-192
12378-PeCDF	53.3	40-67	13C-23478-PeCDF	103	13-328
23478-PeCDF	56.3	34-80	13C-123478-HxCDF	94.4	19-202
123478-HxCDF	46.2	36-67	13C-123678-HxCDF	101	21-159
123678-HxCDF	54.0	42-65	13C-234678-HxCDF	93.3	22-176
234678-HxCDF	50.1	35-78	13C-123789-HxCDF	92.2	17-205
123789-HxCDF	51.5	39-65	13C-1234678-HpCDF	83.1	21-158
1234678-HpCDF	57.0	41-61	13C-1234789-HpCDF	92.6	20-186
1234789-HpCDF	54.0	39-69			
OCDF	112	63-170			
			CRS		
			37Cl4-2378-TCDD	101	31-191

(a) Limits based on method acceptance criteria.

Analyst: JMH **Reviewed by: BS**

CERES Analytical Laboratory, Inc.
4919 Windplay Dr.Suite 1, El Dorado Hills, CA 95762

EPA Method 1613

Client Sample ID: STSMH2712 (A4A1516-05)		
Project ID: A4A1516	**Ceres Sample ID:** 17474-001	**Date Received:** 1/31/2024
	QC Batch #: 3072	**Date Extracted:** 2/4/2024
Date Collected: 1/27/2024	**Matrix:** Aqueous	**Date Analyzed:** 2/5/2024
Time Collected: 14:10	**Sample Size:** 0.952 L	

Analyte	Conc. (pg/L)	MDL	RL	Qual.
2,3,7,8-TCDD	ND< 2.11	2.96	5.25	
12378-PeCDD	ND< 11.0	8.39	26.3	
123478-HxCDD	ND< 5.78	16.6	26.3	
123678-HxCDD	ND< 4.72	9.38	26.3	
123789-HxCDD	ND< 5.47	9.18	26.3	
1234678-HpCDD	ND< 6.81	7.31	26.3	
OCDD	ND< 7.55	22.2	52.5	
2,3,7,8-TCDF	ND< 2.58	1.44	5.25	
12378-PeCDF	ND< 7.56	6.86	26.3	
23478-PeCDF	ND< 7.11	5.95	26.3	
123478-HxCDF	ND< 5.19	8.38	26.3	
123678-HxCDF	ND< 5.31	8.04	26.3	
234678-HxCDF	ND< 6.00	6.88	26.3	
123789-HxCDF	ND< 10.5	7.81	26.3	
1234678-HpCDF	ND< 4.48	7.73	26.3	
1234789-HpCDF	ND< 7.10	7.07	26.3	
OCDF	ND< 8.17	9.32	52.5	

Totals	Conc. (pg/L)	EMPC
Total TCDD	ND< 2.11	
Total PeCDD	ND< 11.0	
Total HxCDD	ND< 5.78	
Total HpCDD	ND< 6.81	
Total TCDF	ND< 2.58	
Total PeCDF	ND< 7.56	
Total HxCDF	ND< 10.5	
Total HpCDF	ND< 7.10	

Labeled Standards	% R	LCL-UCL (a)	Qualifiers
13C-2378-TCDD	103	25-164	
13C-12378-PeCDD	116	25-181	
13C-123478-HxCDD	83.8	32-141	
13C-123678-HxCDD	87.7	28-130	
13C-1234678-HpCDD	99.5	23-140	
13C-OCDD	132	17-157	
13C-2378-TCDF	89.3	24-169	
13C-12378-PeCDF	116	24-185	
13C-23478-PeCDF	118	21-178	
13C-123478-HxCDF	129	26-152	
13C-123678-HxCDF	118	26-123	
13C-234678-HxCDF	128	28-136	
13C-123789-HxCDF	112	29-147	
13C-1234678-HpCDF	130	28-143	
13C-1234789-HpCDF	127	26-138	

CRS

37Cl4-2378-TCDD	100	35-197	

DL - Signifies Non-Detect (ND<) sample specific detection limit.
EMPC - Estimated Maximum Possible Concentration due to ion abundance ratio failure.
(a) - Lower control limit - Upper control limit
(b) - TEQ based on (2005) World Health Organization (WHO) Toxic Equivalent Factors.

Total Toxic Equivalency (TEQ min.) (b)**:** 0.0 pg/L

Analyst: JMH **Reviewed by: BS**

CERES Analytical Laboratory, Inc.
4919 Windplay Dr.Suite 1, El Dorado Hills, CA 95762

EPA Method 1613

Client Sample ID: STSMH1914 (A4A1516-06)		
Project ID: A4A1516	**Ceres Sample ID:** 17474-002	**Date Received:** 1/31/2024
	QC Batch #: 3072	**Date Extracted:** 2/4/2024
Date Collected: 1/27/2024	**Matrix:** Aqueous	**Date Analyzed:** 2/5/2024
Time Collected: 14:20	**Sample Size:** 0.960 L	

Analyte	Conc. (pg/L)	MDL	RL	Qual.
2,3,7,8-TCDD	ND< 2.27	2.96	5.21	
12378-PeCDD	ND< 9.53	8.39	26.0	
123478-HxCDD	ND< 7.75	16.6	26.0	
123678-HxCDD	ND< 6.98	9.38	26.0	
123789-HxCDD	ND< 8.10	9.18	26.0	
1234678-HpCDD	230	7.31	26.0	
OCDD	1130	22.2	52.1	
2,3,7,8-TCDF	ND< 2.72	1.44	5.21	
12378-PeCDF	ND< 7.22	6.86	26.0	
23478-PeCDF	ND< 6.50	5.95	26.0	
123478-HxCDF	ND< 3.73	8.38	26.0	
123678-HxCDF	ND< 3.71	8.04	26.0	
234678-HxCDF	ND< 4.15	6.88	26.0	
123789-HxCDF	ND< 6.05	7.81	26.0	
1234678-HpCDF	67.5	7.73	26.0	
1234789-HpCDF	ND< 4.37	7.07	26.0	
OCDF	99.9	9.32	52.1	

Totals	Conc. (pg/L)	EMPC
Total TCDD	ND< 2.27	
Total PeCDD	ND< 9.5	
Total HxCDD	23.3	
Total HpCDD	428	
Total TCDF	ND< 2.72	
Total PeCDF	ND< 7.22	
Total HxCDF	59.7	
Total HpCDF	129	

Labeled Standards	% R	LCL-UCL (a)	Qualifiers
13C-2378-TCDD	100	25-164	
13C-12378-PeCDD	114	25-181	
13C-123478-HxCDD	84.5	32-141	
13C-123678-HxCDD	85.0	28-130	
13C-1234678-HpCDD	94.1	23-140	
13C-OCDD	129	17-157	
13C-2378-TCDF	93.7	24-169	
13C-12378-PeCDF	130	24-185	
13C-23478-PeCDF	123	21-178	
13C-123478-HxCDF	116	26-152	
13C-123678-HxCDF	101	26-123	
13C-234678-HxCDF	111	28-136	
13C-123789-HxCDF	106	29-147	
13C-1234678-HpCDF	105	28-143	
13C-1234789-HpCDF	106	26-138	

CRS

37Cl4-2378-TCDD	102	35-197	

DL - Signifies Non-Detect (ND<) sample specific detection limit.
EMPC - Estimated Maximum Possible Concentration due to ion abundance ratio failure.
(a) - Lower control limit - Upper control limit
(b) - TEQ based on (2005) World Health Organization (WHO) Toxic Equivalent Factors.

Total Toxic Equivalency (TEQ min.) (b)**:** 3.34 pg/L

Analyst: JMH **Reviewed by: BS**

Section VI: Sample Tracking

SUBCONTRACT ORDER

Apex Laboratories

A4A1516

DJC 1/29/24 DJS

SENDING LABORATORY:

Apex Laboratories
6700 S.W. Sandburg Street
Tigard, OR 97223
Phone: (503) 718-2323
Fax: (503) 336-0745
Project Manager: Darrell Auvil

RECEIVING LABORATORY:

Ceres Analytical Laboratory, Inc
4919 Windplay Drive, Suite 1
El Dorado Hills, CA 95762
Phone :(916) 932-5011
Fax: -9

Sample Name: STSMH2712 **Water** **Sampled: 01/27/24 14:10** (A4A1516-05)

Analysis	Due	Expires	Comments
1613B Dioxins and Furans (SUB)	02/09/24 17:00	01/26/25 14:10	Ceres
Containers Supplied:			
(D)1 L Amber Glass - Non Preserved			
(E)1 L Amber Glass - Non Preserved			

Sample Name: STSMH1914 **Water** **Sampled: 01/27/24 14:20** (A4A1516-06)

Analysis	Due	Expires	Comments
1613B Dioxins and Furans (SUB)	02/09/24 17:00	01/26/25 14:20	Ceres
Containers Supplied:			
(D)1 L Amber Glass - Non Preserved			
(E)1 L Amber Glass - Non Preserved			

Standard TAT

Released By	Date	Received By	Date	
UPS (Shipper)	1/30/24 1404	UPS (Shipper)		
Released By	Date	Received By	1/31/24	1135
			Date	

Sample Receipt Check List Logged by: JL (initials)

Ceres ID: 12474	Date/Time: 1/31/24 1130
Client Project ID: A4A 1516	Received Temp: 2.6 °C Acceptable: (Y) / N
Chain of Custody Relinquished by signed?	(Y) / N
Chain of Custody Received by signed?	(Y) / N
Custody Seals? Present?	Y / N
Intact?	Y / N
NA:	(NA)
Unlabeled / Illegible Samples	Y / (N)
Proper Containers:	(Y) / N
Preservation Acceptable (Chemical or Temperature)?	(Y) / N
Drinking Water, Sodium Thiosulfate present?	Y / (N) / NA
Residual Cl?	Y / (N) / NA
Aqueous sample pH: 7.7	NA
List COC discrepancies: JL 1/31/24	
List Damaged Samples: JL 1/31/24	

Section VII: Qualifiers/Abbreviations

J	Concentration found below the lower quantitation limit but greater than zero.
B	Analyte present in the associated Method Blank.
E	Concentration found exceeds the Calibration range of the HRGC/HRMS.
D	This analyte concentration was calculated from a dilution.
X	The concentration found is the estimated maximum possible concentration due to chlorinated diphenyl ethers present in the sample.
H	Recovery limits exceeded. See cover letter.
*****	Results taken from dilution.
I	Interference. See cover letter.
Conc.	Concentration Found
DL	Calculated Detection Limit
ND	Non-Detect
% Rec.	Percent Recovery

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - USEPA Method 1613B Dioxin/ Furan Data Review

Project: PNW0524C- Port of Portland Terminal 4 Stormwater Sampling	Completed by: Bernave Tinajero	Reviewed by: Todd Olsen
Laboratory Report IDs/Laboratory: A4A1516/ Apex Laboratories, Tigard, OR	Date: 3/1/2024	Date: 3/3/2024

Item	*Yes*	*No*	*NA*	*Comments*
A. Validation Summary				
1. Were data qualified as a result of the validation?		X		
a. Were any data rejected?		X		
2. Were the qualifications added to the appropriate Excel file (e.g., EDD with qualifiers file or flat file)?			X	
B. Package Completeness				
1. Have the data been provided in a Level II deliverable?	X			
2. Is a laboratory narrative or cover letter present?	X			
3. Has the correct compound list been reported?	X			
4. Are the reporting limits appropriate in order to support the project action limits?		X		The laboratory EDL for 2,3,7,8-TCDD did not meet the SLV stated in the project work plan.
C. Preservation/Lab Receipt/Analysis				
1. Were the samples properly preserved (Aqueous & solid: 0-6°C)?	X			
2. Were the holding times met (1 year from collection to extraction; 40 days from extraction to analysis)	X			
3. For sediment is the % moisture >70% for any of the samples?			X	

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - USEPA Method 1613B Dioxin/ Furan Data Review

Item	*Yes*	*No*	*NA*	*Comments*
4. For sediments, is the % moisture >90% for any of the samples?			X	
5. Were any data qualified based on the responses for this section?		X		
D. Blanks				
1. Was a method blank analyzed at the proper frequency?	X			
a. Were analytes detected in the method blank?		X		
2. Were source blanks analyzed?		X		
a. Were analytes detected in the source blank?			X	
3. Were equipment blanks analyzed?		X		
a. Were analytes detected in the equipment blank?			X	
4. Were any data qualified based on the responses for this section?		X		
E. Quality Control Checks				
Internal Standards				
1. Were the appropriate internal standards listed?	X			
2. Are the recoveries within the laboratory limits?	X			
MS/MSD				
3. Frequency of 1/20 samples?		X		No MS/MSD pairs were reported. OPR samples were used to assess accuracy, and batch-specific precision was not assessed.
4. Were full analyte spikes used for the MS/MSD?			X	
5. Spike recoveries within limits?			X	
6. RPD within limits?			X	

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - USEPA Method 1613B Dioxin/ Furan Data Review

Item	*Yes*	*No*	*NA*	*Comments*
OPR				
7. Was an OPR sample analyzed with each analytical batch?	X			
8. Were full analyte spikes used for the OPR?	X			
9. Were recoveries within the laboratory limits?	X			
10. Were any data qualified based on the responses for this section?		X		
F. Compound Identification and Quantitation				
1. Were samples analyzed at a dilution?		X		
a. Were reporting limits adjusted for dilution?			X	
2. Were any data qualified based on the responses for this section?		X		
G. Field Duplicate				
1. Were field duplicates collected?		X		
2. Were they within the QAPP or validation acceptance criteria (≤30% RPD for aqueous and ≤50% RPD for solid)?			X	
3. Were any data qualified based on the responses for this section?		X		

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - USEPA Method 1613B Dioxin/ Furan Data Review

INSTRUCTIONS

1. Data shall be qualified using professional judgment along with Method 1613B and the guidance provided in the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, November 2020 (EPA 540-R-20-005).
2. Data qualifiers which will be applied to the data as applicable are as follows:
   U: The analyte was analyzed for, but was not detected at or above the reported sample quantitation limit. Upon application of the U qualifier to a reported result, the definition changes to "not detected at or above the reported result".
   J: The analyte was positively identified; the associated numerical value is an estimated concentration of the analyte in the sample.
   J-: The analyte was positively identified; the associated numerical value is an estimated concentration, the result may be biased low.
   J+: The analyte was positively identified; the associated numerical value is an estimated concentration, the result may be biased high.
   UJ: The analyte was not detected at or above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
   R: The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - USEPA Method 1613B Dioxin/ Furan Data Review

ACRONYMS

EDD	Electronic Data Deliverable
EDL	Estimated Detection Limit
ID	Identification
MDL	Method Detection Limit
MS/MSD	Matrix Spike/Matrix spike duplicate
NA	Not applicable
OPR	Ongoing Precision and Recovery
RPD	Relative percent difference
SLV	Surface Water Screening Level Values from Table 3-1 of the Portland Harbor Joint Source Control Strategy (DEQ and EPA, 2005).
USEPA	United States Environmental Protection Agency

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - USEPA Method 1613B Dioxin/ Furan Data Review

DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits and RPD outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other
14	Lab flag removed; no validation qualification required

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - Standard Method 2540D Total Suspended Solids Data Review

Project: PNW0524C- Port of Portland Terminal 4 Stormwater Sampling	Completed by: Bernave Tinajero	Reviewed by: Todd Olsen
Laboratory Report IDs/ Laboratory: A4A1516/ Apex Laboratories, Tigard, OR	Date: 3/1/2024	Date: 3/3/2024

Item	*Yes*	*No*	*NA*	*Comments*
A. Validation Summary				
1. Were data qualified as a result of the validation?	X			Refer to the comments section at the end of this checklist.
a. Were any data rejected?		X		
2. Were the qualifications added to the appropriate Excel file (e.g., EDD with qualifiers file or flat file)?	X			
B. Package Completeness				
1. Have the data been provided in a Level II deliverable?	X			
2. Is a laboratory narrative or cover letter present?	X			
3. Has the correct compound list been reported?	X			
4. Are the reporting limits appropriate in order to support the project action limits?			X	
C. Preservation/Lab Receipt/Analysis				
1. Were the samples properly preserved (Aqueous & solid: 0-6ºC)?	X			
2. Were the holding times met (7 days from sampling to analysis for both aqueous and solid samples)?	X			

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - Standard Method 2540D Total Suspended Solids Data Review

Item	*Yes*	*No*	*NA*	*Comments*
5. Were any data qualified based on the responses for this section?		X		
D. Blanks				
1. Was a method blank analyzed at the proper frequency?	X			
a. Were analytes detected in the method blank?		X		
2. Were source blanks analyzed?		X		
a. Were analytes detected in the source blank?			X	
3. Were equipment blanks analyzed?		X		
a. Were analytes detected in the equipment blank?			X	
4. Were any data qualified based on the responses for this section?		X		
E. Quality Control Checks				
MS/MSD				
1. Frequency of 1/20 samples?		X		No MS/MSD pairs were reported. SRM samples were used to assess accuracy, and laboratory duplicate samples were used to assess precision.
2. Were full analyte spikes used for the MS/MSD?			X	
3. Spike recoveries within limits?			X	
4. RPD within limits?			X	
SRM				
5. Was an SRM sample analyzed with each analytical batch?	X			
6. Were full analyte spikes used for the SRM?	X			
7. Were recoveries within the laboratory limits?	X			

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - Standard Method 2540D Total Suspended Solids Data Review

Item	*Yes*	*No*	*NA*	*Comments*
10. Were any data qualified based on the responses for this section?		X		
F. Compound Identification and Quantitation				
1. Were samples analyzed at a dilution?		X		
a. Were reporting limits adjusted for dilution?			X	
2. Were any data qualified based on the responses for this section?		X		
G. Laboratory Duplicate				
1. Were laboratory duplicates analyzed with each analytical batch?	X			
2. Were they within the QAPP or validation acceptance criteria (≤30% RPD for aqueous and ≤50% RPD for solid)?	X			
3. Were any data qualified based on the responses for this section?		X		

Comments:

- The TSS concentrations in samples STSMH2710, STSMH2603, STSMH2615, STSMH2615-DUP, and STSMH2712 were flagged by the laboratory with "TSS", indicating solids results are reported as estimates when less than 2.5 mg residue is recovered during analysis; all method QC requirements have been met for samples, and reporting levels are adjusted based on volume filtered. Therefore, the TSS concentrations in the associated samples were J flagged as estimated.
- The RPD for TSS was greater than 30% for FD pair STSMH2615/STSMH2615-DUP. Therefore, the TSS concentrations in the field duplicate pair were J qualified as estimated.

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - Standard Method 2540D Total Suspended Solids Data Review

Sample ID	Compound	Laboratory Result (mg/L)	Laboratory Flag	Validation Result (mg/L)	Validation Qualifier	Reason Code
STSMH2710	Total Suspended Solids	13.0	TSS	13.0	J	13
STSMH2603	Total Suspended Solids	6.00	TSS	6.00	J	13
STSMH2615	Total Suspended Solids	8.00	TSS	8.00	J	13
STSMH2615-DUP	Total Suspended Solids	12.0	TSS	12.0	J	13
STSMH2712	Total Suspended Solids	6.00	TSS	6.00	J	13

mg/L - Milligram per liter
TSS – Laboratory flag indicating dried residue was less than 2.5mg as specified in the method. Results meet regulatory requirements.

Sample ID	Compound	Laboratory Result (mg/L)	RPD (%)	Laboratory Flag	Validation Result (mg/L)	Validation Qualifier	Reason Code
STSMH2615	Total Suspended Solids	8.00	40	TSS	8.00	J	7
STSMH2615-DUP	Total Suspended Solids	12.0		TSS	12.0	J	7

mg/L - Milligram per liter
TSS – Laboratory flag indicating dried residue was less than 2.5mg as specified in the method. Results meet regulatory requirements.

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - Standard Method 2540D Total Suspended Solids Data Review

INSTRUCTIONS

1. Data shall be qualified using professional judgment along with Standard Method 2540D and the guidance provided in the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, November 2020 (EPA 542-R-20-006).
2. Data qualifiers which will be applied to the data as applicable are as follows:
   U: The analyte was analyzed for, but was not detected at or above the reported sample quantitation limit. Upon application of the U qualifier to a reported result, the definition changes to "not detected at or above the reported result".
   J: The analyte was positively identified; the associated numerical value is an estimated concentration of the analyte in the sample.
   J-: The analyte was positively identified; the associated numerical value is an estimated concentration, the result may be biased low.
   J+: The analyte was positively identified; the associated numerical value is an estimated concentration, the result may be biased high.
   UJ: The analyte was not detected at or above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
   R: The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - Standard Method 2540D Total Suspended Solids Data Review

ACRONYMS

EDD	Electronic Data Deliverable
ID	Identification
MS/MSD	Matrix Spike/Matrix spike duplicate
NA	Not applicable
RPD	Relative percent difference
SRM	Standard Reference Material
TSS	Total Suspended Solids
USEPA	United States Environmental Protection Agency

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - Standard Method 2540D Total Suspended Solids Data Review

DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits and RPD outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other
14	Lab flag removed; no validation qualification required

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - USEPA Method 8082 Polychlorinated Biphenyl Data Review

Project: PNW0524C - Port of Portland Terminal 4 Stormwater Sampling	Completed by: Bernave Tinajero	Reviewed by: Todd Olsen
Laboratory Report IDs/Laboratory: A4A1516/ Apex Laboratories, Tigard, OR	Date: 3/1/2024	Date: 3/3/2024

Item	*Yes*	*No*	*NA*	*Comments*
A. Validation Summary				
1. Were data qualified as a result of the validation?		X		
a. Were any data rejected?		X		
2. Were the qualifications added to the appropriate Excel file (e.g., EDD with qualifiers file or flat file)?			X	
B. Package Completeness				
1. Have the data been provided in a Level II deliverable?	X			
2. Is a laboratory narrative or cover letter present?	X			
3. Has the correct compound list been reported?	X			
4. Are the reporting limits appropriate in order to support the project action limits?	X			
C. Preservation/Lab Receipt/Analysis				
1. Were the samples properly preserved (Aqueous & solid: 0-6°C)?	X			
2. Were the holding times met (1 year from collection to extraction; 40 days from extraction to analysis)	X			
3. For sediment is the % moisture >70% for any of the samples?			X	

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - USEPA Method 8082 Polychlorinated Biphenyl Data Review

Item	*Yes*	*No*	*NA*	*Comments*
4. For sediments, is the % moisture >90% for any of the samples?			X	
5. Were any data qualified based on the responses for this section?		X		
D. Blanks				
1. Was a method blank analyzed at the proper frequency?	X			
a. Were analytes detected in the method blank?		X		
2. Were source blanks analyzed?		X		
a. Were analytes detected in the source blank?			X	
3. Were equipment blanks analyzed?		X		
a. Were analytes detected in the equipment blank?			X	
4. Were any data qualified based on the responses for this section?		X		
E. Quality Control Checks				
Surrogates				
1. Were the appropriate surrogates listed?	X			
2. Are the recoveries within the laboratory limits?	X			
MS/MSD				
3. Frequency of 1/20 samples?		X		No MS/MSD pairs were reported. LCS/ LCSD pairs were used to assess precision and accuracy.
4. Were full analyte spikes used for the MS/MSD?			X	
5. Spike recoveries within limits?			X	
6. RPD within limits?			X	
LCS/ LCSD				

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - USEPA Method 8082 Polychlorinated Biphenyl Data Review

Item	*Yes*	*No*	*NA*	*Comments*
7. Was an LCS/LCSD pair analyzed with each analytical batch?	X			
8. Were full analyte spikes used for the LCS and LCSD?	X			
9. Were recoveries within the laboratory limits?	X			
10. RPD within limits?	X			
11. Were any data qualified based on the responses for this section?		X		
F. Compound Identification and Quantitation				
1. Were samples analyzed at a dilution?		X		
a. Were reporting limits adjusted for dilution?			X	
2. Were any data qualified based on the responses for this section?		X		
G. Field Duplicate				
1. Were field duplicates collected?		X		
2. Were they within the QAPP or validation acceptance criteria (≤30% RPD for aqueous and ≤50% RPD for solid)?			X	
3. Were any data qualified based on the responses for this section?		X		

Comments:

- All PCB results were flagged by the laboratory with "C-07", indicating the sample extracts underwent sulfuric acid cleanup by USEPA method 3665A, sulfur cleanup by USEPA method 3660B, and Florisil cleanup by USEPA method 3620B in order to minimize matrix interference. Since the batch quality control samples also underwent these cleanup procedures, and based on professional and technical judgement, data quality was not considered affected and no qualifications were applied to the data.

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - USEPA Method 8082 Polychlorinated Biphenyl Data Review

INSTRUCTIONS

1. Data shall be qualified using professional judgment along with Method 8082 and the guidance provided in the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, November 2020 (EPA 540-R-20-005).
2. Data qualifiers which will be applied to the data as applicable are as follows:
   U: The analyte was analyzed for, but was not detected at or above the reported sample quantitation limit. Upon application of the U qualifier to a reported result, the definition changes to "not detected at or above the reported result".
   J: The analyte was positively identified; the associated numerical value is an estimated concentration of the analyte in the sample.
   J-: The analyte was positively identified; the associated numerical value is an estimated concentration, the result may be biased low.
   J+: The analyte was positively identified; the associated numerical value is an estimated concentration, the result may be biased high.
   UJ: The analyte was not detected at or above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
   R: The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - USEPA Method 8082 Polychlorinated Biphenyl Data Review

ACRONYMS

EDD	Electronic Data Deliverable
ID	Identification
LCS/LCSD	Laboratory control spike/Laboratory control spike duplicate
MDL	Method Detection Limit
MS/MSD	Matrix Spike/Matrix spike duplicate
NA	Not applicable
PCB	Polychlorinated Biphenyls
RPD	Relative percent difference
USEPA	United States Environmental Protection Agency

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - USEPA Method 8082 Polychlorinated Biphenyl Data Review

DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits and RPD outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other
14	Lab flag removed; no validation qualification required

Geosyntec Consultants Sacramento
Stage 2A Data Review
Data Validation Checklist - USEPA Method 8270E Semi-Volatiles Data Review

Project: PNW0524C- Port of Portland Terminal 4 Stormwater Sampling	Completed by: Bernave Tinajero	Reviewed by: Todd Olsen
Laboratory Report IDs/Laboratory: A4A1516/ Apex Laboratories, Tigard, OR	Date: 3/1/2024	Date: 3/3/2024

Item	*Yes*	*No*	*NA*	*Comments*
A. Validation Summary				
1. Were data qualified as a result of the Stage 2A validation?		X		
a. Were any data rejected?		X		
2. Were the qualifications added to the appropriate Excel file (e.g., EDD with qualifiers file or flat file)?			X	
B. Package Completeness				
1. Have the data been provided in a Level II deliverable?	X			
2. Is a laboratory narrative or cover letter present?	X			
3. Has the correct compound list been reported?	X			
4. Are the reporting limits appropriate in order to support the project action limits?		X		The laboratory MDLs for benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene did not meet CULs stated in the project work plan.
C. Preservation/Lab Receipt/Analysis				
1. Were the samples properly preserved (Aqueous & solid: 0-6°C)?	X			

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Item	*Yes*	*No*	*NA*	*Comments*
2. Were the holding times met (Aqueous samples- 7 days from collection to extraction, solid samples- 14 days from collection to extraction; analysis- 40 days from extraction to analysis for both aqueous and solid)	X			
3. Were any data qualified based on the responses for this section?		X		
D. Blanks				
1. Was a method blank analyzed at the proper frequency?	X			
a. Were analytes detected in the method blank?		X		
2. Were source blanks analyzed?		X		
a. Were analytes detected in the source blank?			X	
3. Were equipment blanks analyzed?		X		
a. Were analytes detected in the equipment blank?			X	
4. Were any data qualified based on the responses for this section?		X		
E. Quality Control Checks				
Surrogates				
1. Were the appropriate surrogates listed?	X			
2. Are the recoveries within the laboratory limits?	X			
MS/MSD				
3. Frequency of 1/20 samples?		X		No MS/MSD pairs were reported. LCS/ LCSD pairs were used to assess precision and accuracy.
4. Were full analyte spikes used for the MS/MSD?			X	
5. Spike recoveries within limits?			X	
6. RPD within limits?			X	
LCS/ LCSD				

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Item	*Yes*	*No*	*NA*	*Comments*
7. Was an LCS/ LCSD pair analyzed with each analytical batch?	X			
8. Were full analyte spikes used for the LCS and LCSD?	X			
9. Were recoveries within the laboratory limits?	X			
10. RPD within limits?	X			
11. Were any data qualified based on the responses for this section?		X		
F. Compound Identification and Quantitation				
1. Were samples analyzed at a dilution?		X		
a. Were reporting limits adjusted for dilution?			X	
2. Were any data qualified based on the responses for this section?		X		
G. Field Duplicate				
1. Were field duplicates collected?		X		
2. Were they within the validation acceptance criteria (≤30% RPD for aqueous and ≤50% RPD for solid)?			X	
3. Were any data qualified based on the responses for this section?		X		

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INSTRUCTIONS

1. Data shall be qualified using professional judgment along with the analytical method USEPA 8270E, the USEPA Contract Laboratory Program National Functional Guidelines for Organic Superfund Data Review, November 2020 (EPA 540-R-20-005).
2. Data qualifiers which will be applied to the data as applicable are as follows:
   U: The analyte was analyzed for, but was not detected at or above the reported sample quantitation limit. Upon application of the U qualifier to a reported result, the definition changes to "not detected at or above the reported result".
   J: The analyte was positively identified; the associated numerical value is an estimated concentration of the analyte in the sample.
   J-: The analyte was positively identified; the associated numerical value is an estimated concentration, the result may be biased low.
   J+: The analyte was positively identified; the associated numerical value is an estimated concentration, the result may be biased high.
   UJ: The analyte was not detected at or above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
   R: The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

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ACRONYMS

CUL	Surface Water Cleanup Levels from Table 17 of the Portland Harbor Record of Decision (EPA, 2017).
EDD	Electronic Data Deliverable
ID	Identification
LCS	Laboratory Control Spike
MDL	Method Detection Limit
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NA	Not Applicable
QC	Quality Control
RL	Reporting Limit
RPD	Relative Percent Difference
SLV	Surface Water Screening Level Values from Table 3-1 of the Portland Harbor Joint Source Control Strategy (DEQ and EPA, 2005).
USEPA	United States Environmental Protection Agency

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DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits and RPD outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other
14	Lab flag removed; no validation qualification required

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Data Validation Checklist - Completeness Review

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Item	***Yes***	***No***	***NA***	***Comments***
A. Completeness/Lab Receipt/Analysis				
1. Is the project name listed on COCs?	X			
2. Are the client IDs listed?	X			
3. IDs match those listed on COC and in the report?	X			
4. Are the sample collection date & time listed for each sample?	X			
5. Is the sample matrix listed?	X			
6. Is the sample preservation noted?			X	
7. Are the requested analyses noted?	X			
8. Were the samples properly relinquished and received?	X			
a. Proper documentation of dates and times?	X			
9. Date & time of lab receipt noted?	X			
10. Lab completed analyses for all samples collected?	X			
11. Sample receipt issues noted/described?			X	
12. Were any data qualified based on the responses for this section?		X		

Comments:

- The USEPA 1613B samples were subcontracted to CERES Analytical Laboratory. The subcontracted laboratory reports were included as part of the in the Apex laboratory reports.
- Surrogates were reported as percent recovery in the laboratory report, but reported as concentrations in micrograms per liter in the EDDs for USEPA methods 8082, 1613B, and 8270E.

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ACRONYMS

COC	Chain of Custody
EDD	Electronic Data Deliverable
ID	Identification
NA	Not applicable
USEPA	United States Environmental Protection Agency