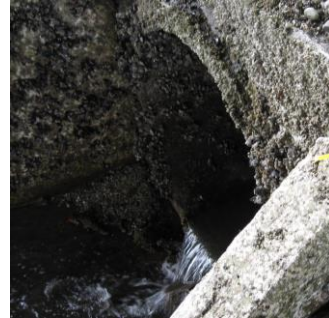


Thea Foss and Wheeler-Osgood Waterways 2021 Source Control and WY2021 Stormwater Monitoring Report

Appendix A – Drain-by-Drain Analysis of Source Control Activities



March 2022

Prepared for

Washington State Department of Ecology and
U.S. Environmental Protection Agency

Prepared by

City of Tacoma



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- Table A.2-1 2021 Pipe Maintenance Activities for OF230
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- Table A.3-1 2021 Pipe Maintenance Activities for OF235

Attachment A.4 – OF237A

- Table A.4-1 2021 Pipe Maintenance Activities for OF237A
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Attachment A.5 – OF237B

- Table A.5-1 2021 Pipe Maintenance Activities for OF237B
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- Table A.6-1 2021 Pipe Maintenance Activities for OF243
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A.1 SOURCE CONTROL SUMMARY

This appendix presents the source control summary for the seven major outfalls discharging to the Thea Foss and Wheeler-Osgood Waterways. For each of the seven outfalls, the following Sections A.2 through A.8 provide a review of current and completed source control investigations, major actions conducted, and other studies performed under the program. Information presented in this appendix includes a description of the action, the end results of the action, the status of actions that are still underway and identification of any follow-up needed.

Based on the review of the source control investigations performed to date and evaluation of whole-water and SSPM data, ongoing source control activities and the work plan for 2022 have been developed and are presented in Section 6.0 of the WY2021 Report.

In the 2015-2019 Commencement Bay Five Year Review Report, the Environmental Protection Agency (EPA) found that the remedial action goals for the Thea Foss Waterway have been achieved. While waterway source monitoring requirements are ongoing to ensure continued protection of the waterway sediments, it is clear that the efforts of the City of Tacoma and others have been effective in reducing sediment concentrations to levels which meet regulatory compliance. On December 11, EPA approved the City's Remedial Action Report, triggering the beginning of the Partial Delisting of the waterway under the Superfund process. EPA currently anticipates that the delisting will be completed in 2022.

With the success of City's source control efforts to date, there are fewer sites in the watershed that require ongoing active source control work. These ongoing investigations and activities are described in detail below. The City has removed upline sediment traps in areas that no longer exhibit ongoing issues with pollutants of concern. Traps will remain in areas with ongoing investigations until work is complete. In addition, the NPDES required locations at the ends of pipe will remain throughout the monitoring period.

A.2 OUTFALL 230

A.2.1 OUTFALL 230 DRAINAGE BASIN

The OF230 drainage basin is located on the mid-portion of the west side of the Thea Foss Waterway. The basin boundaries are shown on Figure 1-3 of the WY2021 Report. The area is approximately 557 acres and discharges to the waterway through a 60-inch outfall pipe (see Appendix B, Table B2-1) located at South 15th Street and Dock Street in the right of way just south of the Fish Peddler Restaurant and Market (formerly Johnny’s Seafood retail market). The general basin boundaries are South 8th Street to the north, South 17th Street to the south, South Ainsworth Avenue to the west, and Dock Street to the east. Most of the storm drainage is channeled to South 15th Street via a main trunk line along Market Street. Because of the steep downhill grade, overflow pipes exist in manholes along Market Street directing excess water to downstream trunk lines. Trunk lines along Dock Street are susceptible to saltwater intrusion from high tides.

To help relieve the burden on the existing storm system, the City is proposed construction of a new 60-inch stormwater outfall discharging to the Thea Foss Waterway. The existing stormwater system did not have sufficient capacity to convey runoff generated during significant storm events occurring in the downtown area. The proposed outfall does not change the nature, strength, or amount of stormwater entering the waterway. The new outfall will receive stormwater from approximately 98% (544 acres) of the current discharge area of OF230 plus 26% (42 acres) of the area currently discharging to OF235. Stormwater from the remaining 2% of the tributary area for OF230 will continue to discharge to the existing OF230 and from 74% of the tributary area for OF235 will continue to discharge to the existing OF235¹. The contributing area (Asset Management Areas) to each outfall will be updated once the project is complete. This project is currently under construction and should be completed in the summer of 2022.

The OF230 drainage basin is heavily developed throughout with primarily commercial land use and some residential use on the west side of the basin. The northern portion of the University of Washington–Tacoma discharges to OF230. Also included in the basin are Tacoma Link Light Rail, the Greater Tacoma Convention and Trade Center, downtown revitalization projects (condos and retail), Dock Street redevelopment, and the Foss Waterway Public Esplanade from South 17th Street to South 11th Street. In addition, the Pacific Avenue Streetscape Project is within the OF230 drainage area.

Baseflow at the OF230 monitoring location is continuous at approximately 0.12 cubic feet per second (see Appendix B, Table B2-2). Sources of baseflow are discussed in Appendix B.

¹ It is anticipated that flow and stormwater monitoring will continue at OF235 and OF230 and monitoring will start at the new outfall once construction is completed. The monitoring of these three outfalls will continue for a minimum of one complete year. After that year, all flow and chemistry data will be evaluated to 1) determine changes in flow/chemistry in the existing OF235 and OF230, 2) establish flow/chemistry metrics at the new outfall and 3) evaluate discontinuing monitoring at OF230 if stormwater flows are minimal. A QAPP update is planned to address these changing conditions.

A.2.2 WY2002-2021 SOURCE CONTROL ACTIVITIES

Since 2002, significant work has been accomplished in the OF230 drainage basin including intense business inspections, complete line cleaning, significant pipe relining projects and identification and removal of point sources. A discussion of specific major source control activities is provided in the following paragraphs.

As part of the City-wide inspection program, 14 business inspections were completed in the OF230 basin in 2021. Business inspections provide source control through education and through implementation of non-structural BMPs. These actions help prevent materials from coming into contact with stormwater and help promote activities that reduce pollutants in stormwater.

Stormwater treatment devices currently in place also remove solids and the associated particulate-bound chemicals from stormwater. The locations of private and public stormwater treatment devices in the OF230 drainage basin are shown on Figure A-1a and A-1b, respectively. In 2021, one new treatment BMP was installed on private property in this drainage basin (see Table A.1-1 and Figure A-1a). A Media Filter treatment device was installed in a retail commercial development on the 1100 block of Martin Luther King Way. With future redevelopment in the OF230 drainage basin, more of these onsite treatment systems will be installed and over time they will help to decrease the solids load and the associated particulate chemical load to the waterway.

Mercury, PCBs, and Phthalates Source Tracing Investigation. There has been an ongoing investigation in a portion of the OF230 drainage basin since 2012 to identify possible sources of intermittent mercury and PCBs discovered during annual sediment monitoring. Prior to this investigation, the FD3A branch was video inspected and cleaned in June 2006. The FD3A branch is one of the oldest stormwater lines in the City of Tacoma and it was not believed to have been cleaned prior to 2006. Since the stormwater lines had never been cleaned, one of the possible sources of COCs found in past sampling was residual accumulated storm sediments from historical sources. The video inspection also revealed that the pipe along Court A from South 15th to South 13th Streets was in disrepair. This pipe section was abandoned and filled with controlled density fill. The stormwater was redirected to a new pipe on A Street in the summer of 2007.

In response to high concentrations of mercury found in up-line sediment traps in 2006, mercury samples were collected from all branches in FD3A, FD18 and FD18B. A point source of mercury was found in a private catch basin (associated with a private parking area by Bates Technical College) near South 11th Street and Yakima Avenue in July 2006. The catch basin and private system were subsequently cleaned. Post-cleaning samples confirmed that the mercury source in that area appeared to have been removed.

In 2010, concentrations of mercury in the up-line sediment traps increased in FD3A and FD18B, indicating the potential of a recurring or new source. In addition, PCB concentrations increased from low to high range in FD3A in 2010. On June 24, 2011, up-line from FD3A, a source control inspector collected dry weather water samples for mercury and PCB analysis. These water samples were grab samples that were collected after a 5-day dry period. Mercury and PCBs were not detected in any of the samples. Therefore, it was determined that the source of mercury and PCBs was unlikely to be from dry weather water discharges.

Mercury concentrations in the OF230 drainage basin have fluctuated between medium and low levels since WY2004, apart from a relatively higher concentration measured in the FD18B and

FD3A-New sediment traps in 2012. Mercury concentrations have remained fairly low since that time with occasional medium concentrations just over the 0.20 mg/kg level set to describe relative medium concentrations on Figure 2-1.1.

PCB concentrations at FD3A were at relatively high levels in WY2010 and WY2011, decreased to low levels in WY2012, and increased back to the high range in WY2013 where they remained through WY2021. At FD3-New, PCB concentrations were at high levels between WY2004 and WY2007, decreased to low levels between WY2008 and WY2013 following cleaning of the drainage system, and increased back to high levels in WY2014. Concentrations fluctuated between low and high levels through WY2021. PCB concentrations in FD18 increased from low to medium levels in WY2011, and from medium to high levels in WY2012 and WY2013. From WY2014 to WY2017, PCB concentrations decreased back to the medium range before returning to the high range in WY2018 where they remained in WY2021. The WY2021 concentration was 780 ug/Kg which is a significant decrease in concentration from the highest concentration of 5300 ug/Kg detected at this location in WY2020. During WY2020 SSPM results showed consistently higher levels of PCBs wherever they were detected. Because these higher concentrations were dispersed across several locations and drainage basins, it did not appear to be caused by a specific event or source. While a cause for these elevated was not identified during the investigation, based on the lower expected results exhibited during WY2021 it was determined that WY2020 results were not accurate and will not be used to determine steps forward in source tracing investigations.

Due to the likely presence of a remaining source or sources of both mercury and PCBs in this drainage basin, specifically the FD18 and FD3A areas, a source tracing investigation was launched in 2012 and continued through 2021 to further investigate potential sources of mercury and PCBs in this area. The investigation generally began with analysis of composite samples representing different segments of the drainage area for each of the sediment trap locations. The intent of this work initially was to attempt to isolate specific problem spots within the drainage area. As branches with higher concentrations of contaminants in composite samples were identified, subsequent phases of the investigation were performed to further isolate potential source areas. Individual catch basin and product samples were taken in the branches with higher concentrations. Subsequently, building inspections were completed in the areas with the highest catch basin and product sample results. Each component of this investigation is described in more detail below.

Mercury: Results from the mercury portion of the investigation and business inspections of the surrounding area indicated that the mercury sources were likely attributable to the presence of contaminated sediments in two areas: a catch basin located at S. 11th and Broadway, and two sidewalk roof drains draining to a catch basin at the corner of South 12th and Court A in downtown Tacoma. Both areas drain to FD3A.

11th and Broadway: The initial investigation and subsequent catch basin sampling identified a catch basin on the sidewalk near the corner of South 11th and Broadway Avenue with relatively higher concentrations of mercury. The basin was resampled in 2016, however staff could not verify that the catch basin had been cleaned prior to sampling. The basin was cleaned on August 16, 2016 and resampled on October 31, 2017. The 2017 sample results showed a decrease from past sampling results; however, the mercury concentration was still higher than typical concentrations found in catch basins. The basins were cleaned in November 2018 and when inspected in August 2019, insufficient was present for sampling. The City resampled this catch basin on June 17, 2020. While mercury concentrations continue to trend downward at this

location, higher than normal basin concentrations remain present. The City will continue to investigate this area for an on-going source of mercury contamination.

South 12th and Court A: Following inspection of the surrounding buildings and inability to locate a source, the initial response action was to clean the system and then re-sample to determine if it was a historic or ongoing source. The drain was resampled in January 2015. With results showing continued higher levels of mercury, the system was again cleaned, and at that time it was discovered that the drain bottoms were rotted out. Resampling showed that, while mercury levels had decreased somewhat, they were still present. Once it was confirmed that no building drains entered this system, the historic drains were capped over to prevent further contaminated sediment from entering the storm conveyance system. The capping work was completed in January 2016, and the system cleaned once again in 2016. The catch basin was resampled in 2017, and the result was lower than previous samples, but still higher than typical concentrations. The basin was cleaned in November 2018 and when inspected in August 2019, insufficient was present for sampling. The City re-sampled the targeted basin in WY2020, and results showed a significant decrease from the 2016 sampling results and the City has determined that there is no longer a mercury source issue at this location.

There are no current investigations for mercury in OF230.

PCBs: Results from the initial PCB portion of the investigation indicated that elevated levels of PCBs were present in the caulking materials from two properties (the Wells Fargo and Sound Physicians (now known as 1123 Pacific Partners) properties located in the vicinity of South 12th and South 13th Streets, between Pacific Avenue and Court A in downtown Tacoma). While this area was identified as the highest priority area, several other areas with lower levels of PCB contamination were also identified through the initial investigation. These areas were initially assigned lower priority ratings since contaminant levels were lower. Storm drains throughout this area were cleaned in February 2015, and the area was resampled in March/April 2016. Results indicated ongoing lower-level sources of PCBs in several areas, leading to additional investigation beginning in 2016 and continuing in 2021. Updates on each of these PCB investigations are provided below.

South 12th and Pacific:

Previous reports have indicated that the caulking materials present on the both the Wells Fargo Complex and the 1123 Pacific Partners property are the source of PCB contamination found in the nearby catch basins in the targeted drainage areas. The business owners and the regulatory agencies were notified of the PCB discovery and were provided a copy of the sampling results. To ensure that the contamination did not reach the waterway, the system was cleaned in early 2015.

Significant work was performed at the Wells Fargo building, and it is expected that this work will reduce the PCB contributions from this site. Phase 1 was completed at the end of December 2016, and the schedule for Phase 2 is being determined at this time. During 2017, the City requested an update of the status of work at the Wells Fargo site. The response from Wells Fargo (Unico) provided an update regarding the remediation of the plaza using proper removal and disposal techniques. Additionally, Unico indicated that they would like to see additional monitoring of the catch basins post abatement to determine if this work removed the main source of contamination. Environmental Compliance (EC) staff resampled the catch basins surrounding this property during 2017 and the results exhibited continued elevated concentrations of PCBs. However, the catch basins were not cleaned after the remediation project was complete and the catch basin socks were still present. The catch basins were

cleaned in October 2017 and it was anticipated that they would be resampled during 2019 when sufficient sediment had accumulated. The system was inspected for the availability of sediment for sampling in August 2019, and sediment levels ranged from zero to 1" of sediment in some basins while other catch basins had yet to be cleaned. Sampling was attempted at the targeted catch basins receiving drainage from Wells Fargo in June of 2020 to determine if a source of PCB contamination remains at this site. Results from this sampling are inconclusive due to the ability to collect from the majority of the targeted catch basin due to lack of access and sediment. During 2022, the City plans on re-targeting these catch basins for resampling to determine if historic contamination is still an issue at this location.

During 2017, the City requested an update of the status of work at the 1123 Pacific Partners site. A written plan of action and timeline were requested. No report was received, and the City initiated the enforcement process. A warning letter was mailed in October 2017. Subsequently, staff worked with the property owner for the 1123 Pacific Partners building to obtain a written plan of action for addressing the PCB contamination on this site. On October 12, 2018, the City received the final correspondence from the property managers stating the remediation had been completed. Sampling of the targeted catch basins was completed in June 2020 to determine if a source of PCB contamination remained at this site. The City successfully sampled two catch basins receiving drainage from this site. The results from this sampling event indicate either a continued source of PCBs at this location or insufficient catch basin cleaning after the remediation of this property. During 2021, the City requested that these catch basins be cleaned, however they were not resampled during WY2021 due to insufficient sediment. During the spring of 2022, the City plans on re-targeting these catch basins for resampling to determine if historic contamination is still an issue at this location

As indicated above, WY2021 sediment trap results for FD3A continued to show elevated PCB concentrations (550 ug/Kg), although they were significantly lower than the concentration of 3600 ug/Kg detected in WY2020. Source control actions are continuing in this area and additional catch basin sampling will be performed when sufficient sediment is present. Sediment trap results for WY2021 will be assessed to monitor the ongoing conditions in this basin.

South 13th and Commerce: During the 2013 investigation, catch basins in this drainage area exhibited detectable levels of PCBs. These catch basins receive drainage from two parking garages and retail businesses on Commerce Street. Two of the catch basins were resampled during the 2016 investigation. Both catch basins sampled exhibited higher concentrations than were found during the 2013 Investigation. During 2017, City staff resampled the catch basins in this drainage area and collected samples from the ROW caulking to determine if this was the source of ongoing PCB contamination. Results indicate that the caulking is unlikely to be the source of the PCB contamination found in the catch basin sediment.

In August 2019, catch basins were inspected for sediment loading to determine whether sampling could occur. Some were found to have insufficient sediment and others were found to have not been cleaned due to coordination needed to de-energize the adjacent light rail. Due to staffing issues during Covid-19, the system cleaning scheduled for 2020 was not completed and was instead completed in May of 2021. It is anticipated that these catch basins will be resampled in summer of 2022.

South 10th and Pacific: The presence of PCBs and ongoing investigation at the Park Plaza parking garage at South 10th and Pacific Avenue were discussed in the WY2016 Source Control Report. In 2016, staff collected samples of roof top material including caulking, sealant, and sediment for PCB analysis. All the samples collected from the roof of the parking garage

exhibited detectable concentrations of PCBs. Additional sampling was performed in 2017 in attempt to determine the specific building materials that were the source of the PCBs. The property owner (the City of Tacoma) and regulatory agencies were notified in writing of the PCB discovery and were provided a copy of the sampling results. The City worked with EPA to finalize a sampling plan in July 2020 to assess the extent of contamination at the site to assist in development of a remediation plan. Sampling was subsequently performed, and the City submitted the Phase 1 and 2 PCB Sampling Results Report to EPA in January 2022. The City has proposed an iterative remediation plan and hopes to begin removal of the perimeter caulk, the primary building material of concern, in summer 2022.

A copy of the Park Plaza North Phase 1 and 2 PCB Sampling Results Report is included in Attachment A.2.

South 9th and Fawcett: This location is in the FD18 drainage area. During the 2013 investigation, the catch basin on S. 9th and Fawcett Avenue exhibited an elevated PCB concentration. A business inspection was conducted during 2014, and no obvious sources of PCBs were identified. The storm drainage system was cleaned in 2015 and resampled in 2016. Concentrations of PCBs detected during this sampling event were higher than those previously detected, indicating an ongoing source.

The investigation in this area continued in 2017. EC staff contacted the property management company for the 757 Fawcett Avenue building and received permission to collect caulking samples from the outside of the building. In addition to the caulking samples, staff collected samples from three catch basins located around the building and three samples of dirt from the sidewalk planting areas receiving drainage from the building. All these samples exhibited detectable concentrations of PCBs, with the caulking material from the building showing very high concentrations. This is likely the source of PCB contamination found in the nearby catch basins. The business and regulatory agencies were notified in writing of the PCB discovery and were provided a copy of the sampling results.

During 2018, City staff continued efforts to obtain a written plan of action for addressing the PCB contamination from the CenturyLink building. In December 2018 a warning letter was sent, with a forty-five-day deadline for submitting a written plan of action and schedule. CenturyLink representatives responded to the letter and indicated that they are working with a consultant to develop a plan.

During 2019, staff continued to work with the business and regulatory agencies to stop the source of PCBs discharging from this site. It is the City's understanding that the property owner intends to encapsulate the building in metal panels. At the end of 2019 they were working on getting permits to complete this work. During 2020, the City continued to work with this property owner and monitored the project to completion (December 2020).

During 2021, the City required the catch basins receiving discharge from this site be cleaned after the project was completed. The City confirmed that the catch basins were cleaned on April 9, 2021. The catch basins were resampled on September 24, 2021 to determine if there continues to be a source of PCBs entering the catch basins. The catch basin sediment exhibited concentrations of 200 ug/Kg, 1100 ug/Kg, and 3500 ug/Kg respectively. Results were received on October 14, 2021. On October 20, 2021, EC staff emailed Lumen (formerly CenturyLink) to inform them of the sampling results and requesting them to clean the sidewalks to potentially remove any residual PCB contamination from the building, and this work was completed on November 18, 2021. EC will request that Sewer Transmission clean the catch basins again in the intersection of 9th and Fawcett to ensure that we get a representative sample after the

sidewalk cleaning in September. Once sufficient sediment has re-accumulated, EC will sample these catch basins again. The sampling is expected to take place in spring 2022.

Phthalates:

The catch basin at South 9th and Commerce has had ongoing issues since 2013 with relatively elevated phthalate concentrations. Catch basins were cleaned in November 2018. At this time, the City is conducting ongoing monitoring and an annual inspection at the farmers market at this site and will resample this location when sufficient sediment is available to determine if a continuing source of phthalates is present at this location. In August 2019, catch basins were inspected and it was noted that insufficient sediment was present for sampling. A sample was collected on June 17, 2020 at the S. 9th and Commerce location. There was a significant decrease in sediment concentrations from 2018 and no further sampling is planned at this location.

The City will continue to work with the regulatory agencies and businesses throughout the area to eliminate the sources of these contaminants in the stormwater drainage system through normal source control efforts.

A copy of the OF230 (FD3A and FD18) 2021 Source Tracing Investigation and the OF230 FD18 Update Report are included in Attachment A.2.

South 14th & Ct. A PAH Source Tracing Investigation

Based on sediment monitoring in OF230, the FD3A drainage area was identified as having ongoing issues with PAH sediment contamination. In response to recurring detections of other contaminants in the FD3A and FD18 drainage areas, the City conducted source tracing investigations in 2012 and 2013 (see Mercury and PCBs Source Tracing Investigation section above). During these investigations, elevated levels of PAHs were found in a specific segment of the FD3A drainage area. Additional investigation was then performed to identify potential sources of this contamination.

In 2014, individual catch basins in the targeted segment were sampled to identify specific catch basins with elevated levels of PAHs. The catch basins with the highest PAH concentrations were those located at the corner of Court A and South 14th Street. Based on these results, staff conducted another site investigation to determine whether the adjacent parking lot was draining to these catch basins and found that it was not. With no specific source of this contamination identified, the system was cleaned in early 2015 and subsequently resampled in 2016 to determine whether the elevated PAH levels were the result of a historic release or an ongoing source of PAH contamination. Results showed continued presence of PAHs in this area. As a result, a business inspection of the adjacent parking lots was conducted, including the collection of several samples from their on-site storm drainage system. While no significant processes were noted during the inspection that would attribute to the elevated PAHs, the sediment samples contained elevated concentrations. The City's evaluation ultimately pointed to coal tar asphalt sealant as a source of the contamination.

The City followed up with the property owner in 2017 to discuss next steps in eliminating this source of PAHs. A letter was sent by the City in April 2017 to the property owner, Arletta Development Corporation, requesting a written plan of action and timeline to eliminate the discharge of PAHs from its facilities to the City's stormwater system. The City met with representatives of the site owner to develop a plan of action. The property management company performed initial sampling of the catch basins in June 2017, then swept the parking

lots and cleaned the private catch basins later that month. Follow-ups catch basin sampling was initially required on a quarterly basis.

During 2018, City staff reviewed the quarterly catch basin sampling performed to date, and the results exhibited non-detectable concentrations for PAHs. As a result, the City agreed to reduce required maintenance and sampling to an annual frequency. In addition, City staff resampled the ROW catch basins exhibiting elevated concentrations of PAHs in previous investigations. While five catch basins were targeted, samples were only collected from three due to lack of collectable sediment in the other two. Two of the three samples exhibited a significant decrease in PAH concentrations, however one sample exhibited similar concentrations found in the 2016 sample. It was subsequently determined that, while the City requested cleaning of the catch basins in this area during 2017, the catch basin containing higher concentrations was not cleaned at that time. Staff re-requested the cleaning for this basin and confirmed cleaning occurred during December 2018.

During 2020, the City re-sampled several right-of-way catch basins. One basin receiving drainage from the A street parking lot had significant sediment in the sump and elevated concentrations of PAHs. After additional investigation, a collapsed and heavily impacted stormline was discovered in the private storm sewer system. The property owner agreed to repair and clean the private storm system. The City will continue to work with the property owner to see this issue resolved, and after cleaning, staff will resample this location when sufficient sediment has accumulated to ensure this PAH source has been removed.

While progress was made during 2021 to repair this private system, permitting delays with the state delayed this project. During 2022, the City will continue to correspond with the property management company regarding the repair and cleaning process of the impacted stormwater lines. Once the work is completed, the City will re-clean the catch basins in the ROW and resample the impacted catch basins once sediment has re-accumulated.

PAH concentrations in FD3A decreased from 111,295 ug/Kg in WY2016 to 82,121 ug/Kg in WY2017, 37,370 ug/Kg in WY2018 to 10,009 ug/Kg in WY2019. Concentrations exhibited a slight increase during 2020 (33,202 ug/Kg) but concentrations remained relatively low compared to historic levels. Concentrations exhibited a significant decrease during 2021 (8,666 ug/Kg). This decrease in concentrations following actions at this site indicates the success of this source control investigation.

A copy of the OF230 (FD3A) South 14th Street and Court A 2021 Source Tracing Report is included in Attachment A.2.

FD16 PCB Investigation.

During 2017, the City began a source tracing investigation in response to recurring detections of PCBs in the FD16 drainage area. Small drainage areas/segments of FD16 were targeted by combining sub-samples from the Right-of-way (ROW) catch basins into a larger composite sample. This approach assisted with identifying problem areas in FD16. The City discovered elevated PCBs in catch basin sediments from three segments in the FD16 drainage basin.

The goal of the 2018 investigation was to further pinpoint sources of PCB contamination in the FD16 drainage area. In June 2018, the City collected discrete samples from catch basins in the drainage area which were identified as contributors to the 2017 composite samples with elevated PCB concentrations. Five locations were identified as having relatively elevated

concentrations of PCBs. The five discrete catch basin locations were cleaned after receipt of laboratory results.

During 2019, City staff narrowed down the contributing area by collecting discrete samples from the catch basins that were part of the composite samples from the previous sampling effort with elevated PCB concentrations. Based on the results of this event, additional sampling was performed to further isolate the area of concern. Results suggest that the relatively low-level contamination is emanating from building materials located at 1301 and 1331 Tacoma Avenue S. With cleaning in the area complete, the City will continue to monitor the sediment traps to determine if PCBs are continuing to discharge to the storm system and will re-evaluate the need for a continued investigation based on those results. The plan was to remove the sediment trap at this location if PCBs remained undetected in WY2021. However, PCB concentrations at this site increased back up to medium levels with a concentration of 170 ug/Kg. The City will continue to monitor sediment trap results during 2022 to determine if further investigation in this drainage basin is needed.

CHB Auto Care PIE Grant. In 2006, Citizen's for a Healthy Bay (CHB) conducted a public education program in the OF230 drainage basin. The program was completed as part of a PIE Grant and included a survey, working with school children, meeting with neighborhood organizations, and providing residents with material on proper automobile care with coupons for neighborhood services. Curb marking with "drains to stream" labels was also completed by CHB and the City in the basin. Public surveys showed some improvement in public awareness. However, there was no measurable difference in stormwater data between OF230 and the OF235 control basin where no public education was offered.

Storm System Cleaning. At a cost of \$300,000, the entire municipal storm drainages for OF230 and OF235 were cleaned, and video inspected by the City's Transmission Maintenance crews in 2007. One-hundred years of accumulated historical stormwater particulate matter in the trunk lines and laterals (totaling approximately 220 cubic yards) was removed. Eighty-thousand feet of 8 to 56-inch lines were cleaned between March 12 and June 25, 2007. Throughout the duration of the project, standardized cleaning practices were used (i.e., plugs downstream of vactor truck) to prevent any mobilized materials from entering the Thea Foss Waterway. The decant water from the vactor trucks was diverted to settling tanks prior to discharge to the sanitary sewer.

Since the time of the complete cleaning of the OF230 drainage basin, additional cleaning has been performed in isolated areas. These cleaning and video inspection activities have been done for a variety of reasons, including areas identified as needing maintenance through the STRAP program, complaints, business inspection follow-ups, etc. A summary of pipe cleaning and maintenance activities completed during 2021 in the OF230 drainage basin is provided in Table A.2-1 in Attachment A.2.

Enhanced Street Sweeping. In January 2007, the City's street sweeping program was transferred from the Streets and Grounds division to the Sewer Transmission Maintenance section for continued implementation. The program was enhanced at that time in an attempt to reduce sediment buildup in the storm sewer system. The schedule was set to sweep all areas of the City twice per year, with more frequent sweeping in the business districts and on major arterials. The City also increased communications with residents and business owners, which helped raise awareness of the importance of the street sweeping program.

In 2007, when the work was transferred over, sweeping was done with a combination of mechanical and vacuum sweepers. In 2008, the City started the transition from mechanical

sweepers to regenerative air machines. At this point in the program, the City used four regenerative air sweepers. In mid-2018 due to the end of usable life of one of the City's regenerative air sweepers and a staff retirement, Tacoma temporarily reduced its street sweeping program. This resulted in Tacoma reducing the frequency of arterial sweeping to quarterly and residential streets to annually. The City received a grant from Ecology in 2021 to purchase an additional street sweeper which will allow staff to increase back to the higher sweeping frequency. The proposed schedule will increase the frequency of sweeping at arterials from every 12 weeks to every 6 weeks and increase residential sweeping to twice per year. The sweeper was purchased during 2021, however there are currently delivery delays. The expected delivery date is October 2022 – early January 2023. GPS is used to track the number of miles swept and the amount of material removed is recorded.

2010 Stormwater Pipe Retrofit Project. From June to November 2010, 13,500 linear feet of existing storm sewer main was structurally rehabilitated in the downtown district. The main segments targeted were tributary to OF230. Defects (cracks, holes, etc.) in the aging system could allow groundwater and soil (potentially contaminated from historic "hot spots") to enter the system and ultimately discharge to the Thea Foss Waterway. Rehabilitation of the existing main segments was accomplished by means of Cured-In-Place Pipe (CIPP) construction technologies. Resin impregnated liners were inserted into the main segments through existing manholes and the liner was then pressurized causing it to expand and form to the inside of the existing main segment. A source of heat was then applied which caused the resins to catalyze. The end result was a new pipe within the existing pipe that has similar strength and durability characteristics to PVC pipe. It is anticipated that these projects will also result in improvements in water and SSPM quality.

When properly installed, the CIPP liner results in continuous stormwater pipe segments with no joints (except for manhole connections), that are free of leaks associated with structural defects. The resulting reduction in inflow and infiltration may reduce the contaminant load to waters of the state if contaminated groundwater is present. Final project costs, including design and management, were \$741,506. This project was funded by a \$1,000,000 Ecology grant.

2013 Stormwater Pipe Retrofit Project. From August 8 through November 15, 2013, 13,807 linear feet of existing storm sewer main, 65 segments, was structurally rehabilitated in asset management area FS05. The segments that were rehabilitated in OF230 ranged in size from 8 inches to 21 inches in diameter. Similar to the 2010 Stormwater Pipe Retrofit project, rehabilitation of the existing main segments was accomplished by means of CIPP construction technologies. It is anticipated that these projects will also result in improvements in water and SSPM quality. Final project costs were \$1,048,158 which includes all work completed in asset management areas FS05, FS06 and FS07.

Prior to installation of the CIPP liner the main line is thoroughly cleaned to remove all debris and to verify if a segment can be retrofitted using the CIPP construction technology. In FS05, 76 segments, 16,274 linear feet of pipe, were cleaned and video inspected between July 24 and October 7, 2013. During cleaning, the main line was plugged, and the cleaning water and material was removed from the main using a vactor truck. The cleaning water and entrained sediment was pumped into a sediment removal system to separate the solids from the water. After filtration the water was discharged into the sanitary sewer. Approximately 10 tons of material was removed from the main segments cleaned in asset management areas FS05, FS06 and FS07.

Sauro's Cleanerama Site Remediation. The Sauro's Cleanerama, which is now closed, released dry cleaning solvents into the environment. The City completed an interim action (IA) cleanup at the Sauro's Cleanerama site during December 2009, under an Agreed Order with the Ecology. During the IA the City removed and disposed of 12,010 tons of soil contaminated by dry cleaning solvents released to the environment during facility operations.

During 2015 the City of Tacoma signed a revised Agreed Order with the Department of Ecology to remediate groundwater contamination by natural attenuation. The final cleanup action to remediate the groundwater will take approximately 10 years. The Cleanup Action Plan includes ongoing groundwater monitoring to assess remediation progress during the cleanup action. For the first two years under the order, monitoring was performed semi-annually under the order. During 2018, monitoring was reduced to annually. Data is reported annually to Ecology. January 2022 monitoring results continue to show the capacity for natural attenuation to occur at this site as well as down gradient (closest to the Foss waterway).

March 2011 Sanitary Sewer Discharge. A sanitary sewer main in the vicinity of South 15th and Market Streets collapsed on March 15, 2011. The pipe in this area was originally installed in 1906. The City replaced both the sanitary and storm pipes in this intersection as a result of the failure. It was estimated that 18,000 gallons of sewage discharged to the storm sewer and eventually to the Thea Foss Waterway over a two-hour period. The sanitary sewer overflow was reported to Ecology.

Pacific Avenue Streetscape Project. The Pacific Avenue Streetscape project included beautification in addition to innovative stormwater improvements. The project area is a ten-block area on Pacific Avenue between South 7th and South 17th Streets. Key components include innovative stormwater design and pedestrian, bicycle, public transit, and vehicle complete streets concepts. Improvements include new and upgraded sidewalks, new curbs and curb ramps, landscaping, public art, street furnishings, historic streetlights, and roadway repaving. Lastly, a total of 14 rain gardens now treat stormwater prior to it entering the Thea Foss Waterway, as well as new landscaping with over 3,000 new plants. Construction began in late 2012 and was completed in early 2014.

'A' Street Treatment System. Construction of the "A" Street regional treatment system was completed in January 2015. The project is located in the area with historically higher levels of PCBs and mercury, along with lower levels of PAHs and phthalates. The project included replacement of approximately 1,100 feet of pipe and construction of two underground treatment vaults with Baysaver treatment units sized to treat the water quality design storm for the 34-acre tributary area. The City's work toward removal of sources of PCBs and mercury to this system, along with PAHs and phthalates is continuing as described above, but the line replacement and treatment project will help to ensure that these contaminants do not get to the waterway. The treatment system was funded from a \$1,000,000 fiscal year Statewide Stormwater Grant from Ecology.

UST and LUST Removal. The Tacoma-Pierce County Health Department (TPCHD) is overseeing the removal of USTs at four sites in the drainage basin (see Attachment A.1) including:

- UST at Bates Technical College located at 1101 S. Yakima Avenue. There was one tank at the site that was removed on 4/6/20 and the permit remains active.
- UST at Enterprise Rent A Car located at 940 Market Street. There are three tanks on the property and the permit remains active.

- UST at the Seven Eleven Store located at 4635 S Yakima Avenue. This permit remains active.
- UST at Sanford and Sons located at 743 Commerce Street. There is one tank on the site that was removed on 12/7/2021 and the permit is closed.

Notice of Violation and Warning Letters. There were no Warning or Notice of Violation letters issued in this drainage basin in 2021.

A.3 **OUTFALL 235**

A.3.1 **OUTFALL 235 DRAINAGE BASIN**

The OF235 drainage basin is the fourth largest basin in the Foss Waterway Watershed. The drainage basin encompasses a section of downtown between the OF230 and OF237A drainage basins (see WY2021 Report, Figure 1-3). The OF235 drainage basin is heavily developed and covers an area of approximately 156 acres which drains through a 42-inch outfall pipe located on the west bank of the Thea Foss Waterway at South 21st and Dock Streets under the SR509 bridge. The general basin boundaries are South 18th Street to the north, South 23rd Street to the south, South “L” Street to the west and Dock Street to the east.

Commercial land use accounts for the majority of the area in this basin, with a small residential area on the western side (see WY2021 Report, Figure 1-3). A small portion of freeway right-of-way is in the lower part of this basin including I-705 and the entire I-705 and SR-509 interchange. Most of the stormwater runoff from the freeways discharges to an infiltration pond and not to the City-owned storm drains.

The southern portion of the University of Washington–Tacoma and a portion of the St. Joseph Medical Complex discharges to OF235. The drainage area for University of Washington–Tacoma is bounded by Pacific Avenue, South 21st Street, Tacoma Avenue and South 17th Street. Also included in the basin is Tacoma Link Light Rail, downtown revitalization, Dock Street redevelopment and the Foss Waterway Public Esplanade from South 21st Street to South 17th Street.

Baseflow in OF235 is continuous at approximately 0.4 cubic feet per second (see Appendix B, Table B2-2). Sources of baseflow are discussed in Appendix B.

A.3.2 **2002-2021 SOURCE CONTROL ACTIVITIES**

Since 2002, significant work has been accomplished in the OF235 drainage basin including intense business inspections, complete stormline cleaning, and identification and removal of point sources. A discussion of specific major source control activities is provided in the following paragraphs.

As part of the City-wide inspection program, two business inspections were completed in the OF235 drainage basin in 2021. Business inspections provide source control through education and through implementation of nonstructural BMPs. These actions help prevent materials from coming into contact with stormwater and help promote activities that reduce pollutants in stormwater.

Stormwater treatment devices currently in place also remove solids and the associated particulate-bound chemicals from stormwater. The locations of private and public stormwater treatment devices in the OF235 drainage basin are shown on Figures A-1a and A-1b, respectively. No new private or public treatment BMPs were installed in this drainage basin in 2021 (See Table A.1-1). With future redevelopment in the OF235 drainage basin, onsite treatment systems will be installed and over time they will help to decrease the solids load and the associated particulate-bound chemical load to the waterway.

2006 Turbid Water Discharge. On June 14, 2006, June 27, 2006 and July 31, 2006, turbid water was observed discharging from OF235. This corresponds to the highest chemical concentrations in baseflow at this location which were observed in WY2006 (Year 5), (see Table

3-2, and Figure 5-1.2 and boxplots in Appendix G in the 2012 Report). A follow-up inspection on July 31, 2006, found that the discharge was not associated with a sanitary sewer cross-connection. The source of the discharge was not located. These outliers appear to be relatively isolated occurrences.

Storm System Cleaning. At a cost of \$300,000, the entire municipal storm drainages for OF230 and OF235 were cleaned, and video inspected by the City's Transmission Maintenance crews during 2007. One-hundred years of accumulated historical stormwater particulate matter in the trunk lines and laterals, 220 cubic yards, was removed. Eighty-thousand feet of 8 to 56-inch lines were cleaned between March 12 and June 25, 2007. Throughout the duration of the project, standardized cleaning practices were used (i.e., plugs downstream of vactor truck) to prevent any mobilized materials from entering the Thea Foss Waterway. The decant water from the vactor trucks was diverted to settling tanks prior to discharge to the sanitary sewer.

The 2007 video inspection revealed eroded pipe segments and other pipes drilled through the storm lines in some areas. The 2007 video inspections and resulting pipe conditions are tracked as part of the City's STRAP program. A number of relining or replacement projects have been added to the City's list of Capital Improvement Projects (CIP) from the STRAP. One of the relining projects, which included pipes in portions of the OF230, OF235 and OF237A drainage basins, was constructed in 2013 as further described below.

Since the time of the complete cleaning of the OF235 basin, additional cleaning has been performed in the basin in isolated areas. These cleaning and video inspection activities have been done for a variety of reasons, including areas identified as needing maintenance through the STRAP program, complaints, business inspection follow-ups, etc. A summary of pipe cleaning and maintenance activities completed during 2021 in the OF235 drainage basin is provided in Table A.3-1 in Attachment A.3.

Enhanced Street Sweeping. In January 2007, the City's street sweeping program was transferred from the Streets and Grounds division to the Sewer Transmission Maintenance section for continued implementation. The program was enhanced at that time in an attempt to reduce sediment buildup in the storm sewer system. The schedule was set to sweep all areas of the City twice per year, with more frequent sweeping in the business districts and on major arterials. The City also increased communications with residents and business owners, which helped raise awareness of the importance of the street sweeping program.

In 2007, when the work was transferred over, sweeping was done with a combination of mechanical and vacuum sweepers. In 2008, the City started the transition from mechanical sweepers to regenerative air machines. At this point in the program, the City used four regenerative air sweepers. In mid-2018 due to the end of usable life of one of the City's regenerative air sweepers and a staff retirement, Tacoma temporarily reduced its street sweeping program. This resulted in Tacoma reducing the frequency of arterial sweeping to quarterly and residential streets to annually. The City received a grant from Ecology to purchase an additional street sweeper which will allow staff to increase back to the higher sweeping frequency. The proposed schedule will increase the frequency of sweeping at arterials from every 12 weeks to every 6 weeks and increase residential sweeping to twice per year. The sweeper was purchased during 2021, however there are currently delivery delays. The expected delivery date is October 2022 – early January 2023. GPS is used to track the number of miles swept and the amount of material removed is recorded.

2013 Stormwater Pipe Retrofit Project. From July 26 through November 13, 2013, 5,479 linear feet of existing storm sewer main, 32 segments, was structurally rehabilitated in asset

management area FS06. The segments that were rehabilitated in OF235 ranged in size from 8 inches to 18 inches in diameter. Defects (cracks, holes, etc.) in the aging system could allow groundwater and soil (potentially contaminated from historic “hot spots”) to enter the system and ultimately discharge to the Thea Foss Waterway. Rehabilitation of the existing main segments was accomplished by means of Cured-In-Place Pipe (CIPP) construction technologies. Resin impregnated liners were inserted into the main segments through existing manholes and the liner was then pressurized causing it to expand and form to the inside of the existing main segment. A source of heat was then applied which caused the resins to catalyze. The result was a new pipe within the existing pipe that has similar strength and durability characteristics of PVC pipe. It is anticipated that these projects will also result in improvements in water and SSPM quality.

When properly installed, the CIPP liner results in continuous stormwater pipe segments with no joints (except for manhole connections), that are free of leaks associated with structural defects. The resulting reduction in inflow and infiltration may reduce the contaminant load to waters of the state if contaminated groundwater is present. Final project costs are approximately \$1,048,158 which includes all work completed in asset management areas FS05, FS06 and FS07.

Prior to installation of the CIPP liner the main line is thoroughly cleaned to remove all debris and to verify if a segment can be retrofitted using the CIPP construction technology. In FS06, 34 segments, 5,738 linear feet of pipe, were cleaned and video inspected from July 12, 2013 through October 7, 2013. During cleaning, the main line was plugged, and the cleaning water and material was removed from the main using a vactor truck. The cleaning water and entrained sediment was pumped into a sediment removal system to separate the solids from the water. After filtration the water was discharged into the sanitary sewer. Approximately 10 tons of material was removed from the main segments cleaned in asset management areas FS05, FS06 and FS07.

Hood Street Treatment Retrofit Project. The City was awarded a \$1,000,000 fiscal year 2011 Stormwater Retrofit and LID Competitive Grant from Ecology for a \$2,100,000 regional stormwater treatment facility in the Hood Street Corridor through the Brewery District (South 21st Street to South 19th Street). This modified bioretention facility provides regional treatment for stormwater runoff discharged from 42 acres of the FS06 drainage basin in Tacoma’s downtown area. The water quality facility has been operational since fall 2014. The Hood Street Treatment Retrofit project was built in cooperation with the development of the Prairie Line Trail-UWT Station by the University of Washington–Tacoma. The project is a rail-to-trail conversion of Tacoma’s historic freight corridor through the heart of downtown. The Prairie Line Trail has been planned to develop a landmark urban trail for pedestrians and bicyclists.

Outfall 235 Stormwater and Baseflow Lead, PAHs, and Phthalates Source Investigation.

Based on stormwater monitoring in OF235, this basin was identified in the Foss Work Plan as having ongoing issues with lead in stormwater. In August 2014, staff began an investigation to identify possible sources of the elevated lead concentrations in stormwater. Elevated concentrations of phthalates and PAHs were also observed in historic baseflow discharges (Tacoma 2013). Because of this, the focus of the investigation began with an investigation of baseflow in the OF235 basin. The intent of this work was to identify specific problem areas within the drainage basin for further investigation.

Due to lack of baseflow during sample collection, staff was unable to target the entire drainage basin. The preceding summer yielded very little precipitation and it is possible that the baseflow

was not fully charged during this sampling event. The results of this investigation initiated in 2014 did not identify a specific segment or drainage area in this basin for additional source tracing.

Staff continued this investigation of the drainage basin in 2015. Nine locations were targeted for baseflow sampling in March 2015, and samples were collected at six of the nine locations. Three of these areas showed relatively higher concentrations of lead, and one of these locations also had relatively higher phthalates. Based on the results of this phase of the investigation, these three locations were targeted for additional source tracing. Due to lack of baseflow during sample collection, staff was unable to complete the investigation in these specific areas in 2015. Again, the preceding winter and summer yielded very little precipitation and it is possible that the baseflow was not fully charged during the Round 2 sampling event.

Staff conducted Round 3 of this investigation in spring 2016 when baseflow was flowing at its peak, with additional investigation of the three drainage areas where higher concentrations were found. While progress was made during 2016, specific sources of lead, PAHs and phthalates were still not identified. Investigations continued in 2017 to further trace sources of these COCs as well as copper and zinc which were identified in WY2016 as potential COCs.

During the 2017 investigation, no specific sources of lead, phthalates, PAHs, copper, or zinc were identified. Instead, it appears that there are three locations where potentially contaminated groundwater is seeping from the hillside and discharging to the City's stormwater system. Construction activities planned in two of these areas in 2018 were expected to provide some level of appropriate control of the groundwater.

Through 2021, the City monitored the sites in this area with active construction to ensure proper BMPs were maintained. Upon completion, it will be determined whether construction in this area will eliminate runoff from possible contaminated groundwater in this drainage basin. If it is determined that additional groundwater samples will be collected during any continued investigation in this area, the City will research and gain approval of a sampling protocol that will ensure representative samples and limit contamination from surrounding soils/sediment. This project is on hold until the new Foss Waterway outfall is constructed. The construction for the new outfall is currently underway and is scheduled to be completed in the summer of 2022.

Former Heidelberg Brewery USTs. In January 2012, five USTs were located on the Former Heidelberg Brewery site (2120 South "C" Street). Four of the five were uncovered and removed in January 2012, and two areas were found to be contaminated with possible diesel and/or heavy oil. TPCHD worked with the property owner to remove the tanks and complete the remediation of the contamination. Final documentation of the site actions was presented to TPCHD. Based on this review it was determined that the soil remediation project appeared to have been successful in removing petroleum contaminated soil at the site, but cPAH contaminated soil remained at the eastern property line and the extent of cPAH contamination into ROW was unknown.

The site was entered into Ecology's Voluntary Cleanup Program (TPCHD maintains oversight during this interaction), and Ecology issued their determination dated January 28, 2013, reiterating that the site didn't meet minimum cleanup standards, as the cPAH and the groundwater condition of the site needed further investigation. In 2017, following additional cleanup work, the site received a 'property specific' No Further Action determination, acknowledging that, while contamination within the site's property boundary was cleaned up, contamination remained outside the property within the C Street right-of-way.

TPCHD had previously issued a notice to the site owner requiring further action. In addition, TPCHD attached a Certificate of Non-Compliance onto the property title in 2015, which will remain on the title until amended with a Notice of Compliance once cleanup is complete.

In 2018, the owners hired a new consultant and in 2021 renewed their Site Cleanup permit with TPCHD, which is required along with further work leading to a completed cleanup. The permit is currently in place, and as of the end of 2021, the site remains 'open'. The site owner complied with one of the TPCHD's requirements to maintain and annually renew their Health Department Site Cleanup permit. However, they failed to comply with the second requirement to continue with the cleanup action. A rather small amount of residual contamination remains towards and within the right-of-way. While the interior of the property has been cleaned up, the cleanup of the residual contamination will need to be completed before issuing satisfactory Site Closure.

UST and LUST Removal. TPCHD is overseeing the removal of USTs at one site in the drainage basin (see Attachment A.1):

- UST at Heidelberg Brewery at 2120 South C St. The permit remains currently active.

Notice of Violation and Warning Letters. There were no Warning or Notice of Violation letters issued in this drainage basin in 2021.

A.4 OUTFALL 237A

A.4.1 OUTFALL 237A DRAINAGE BASIN

The OF237A drainage basin is approximately 2,823 acres and drains to the Thea Foss Waterway through the west 96-inch outfall located in the 2300 block of East Dock Street at the head of the waterway. As shown in Figure 1-3 of the WY2021 Report, the drainage basin generally extends in the south and west directions from the outfall. The general boundaries are South 19th Street on the north, South 40th Street on the south, Lawrence Street to the west, and Tacoma Avenue on the east.

The OF237A drainage basin contains residential, commercial, and industrial land uses. In addition, freeway rights-of-way for I-5, SR-16, the entire I-5/SR-16 interchange, and a portion of the I-5/I-705 interchange are located within this drainage basin.

Baseflow in OF237A is continuous at approximately 4.4 cubic feet per second (see Appendix B, Table B2-2) and consists primarily of former creeks that were piped. Sources of baseflow are discussed in more detail in Appendix B.

During periods of increased precipitation, the Leach Creek Holding Basin located to the west of the drainage basin is pumped to the OF237A storm drainage system. The Leach Creek Holding Basin is located within the city limits of Fircrest (west of Tacoma) and has functioned as a stormwater facility since 1961, when a dike was constructed along the southern edge of the current site. Several storm pipelines feed the holding basin draining approximately 2,450 acres of residential, commercial, highways, and other high use developed properties in Tacoma and Fircrest. The primary outflow from the holding basin is a gated 42-inch outlet pipe which conveys stormwater to Leach Creek.

The pump station was constructed in 1991 and consists of four pumps, each with a capacity of 24 cubic feet per second (cfs) and maximum combined capacity of 96 cfs. During more intense rain events, stormwater from the Leach Creek Holding Basin is pumped through a 42-inch pipe to the Nalley Valley trunk line and discharged into the Thea Foss Waterway through OF237A. The number of pumps operating depends on the intensity of a given storm event; with any number of the four pumps potentially operating at a given time. At low levels of precipitation, no pumps operate and the water discharges to Leach Creek. At increased levels of precipitation¹, pumps sequentially engage up to a maximum of four pumps. The range of flow to the Nalley Valley system from the Leach Creek Holding Basin is from 0 to 96 cfs. Emergency overflow from the holding basin is provided by a 40-foot-wide emergency spillway which discharges to Leach Creek.

In 2005, 60 feet of the OF237A outfall pipe was replaced by Burlington Northern Railroad as part of their rail track realignment project. Construction included extending the outfall, constructing a new manhole structure, and replacing pipe from the City's sanitary pump station yard (known as Dock Street) to the outfall. The new manhole was constructed downstream of the current stormwater sampling location and FD2 and FD2A. The 23rd Street lateral (FD2A) was rerouted to the new manhole structure in the 237A main trunk line. The new manhole is

¹ According to the City's best estimation, this occurs when greater than ¾-inch of precipitation falls within a 24-hour period.

now used as the end-of-pipe stormwater sampling location and is designated as OF237A New. This sampling location represents discharge from the entire drainage basin.

A.4.2 2002-2021 SOURCE CONTROL ACTIVITIES

Since 2002, significant work has been accomplished in the OF237A drainage basin including intense business inspections, complete line cleaning in many sub-basins, and identification and removal of point sources. A discussion of specific major source control activities is provided in the following paragraphs.

As part of the City-wide inspection program, 75 business inspections were completed in the OF237A drainage basin in 2021. Business inspections provide source control through education and through implementation of nonstructural BMPs. These actions help prevent materials from coming into contact with stormwater and help promote activities that reduce pollutants in stormwater.

Stormwater treatment devices currently in place also remove solids and the associated particulate-bound chemicals from stormwater. The locations of private and public stormwater treatment devices in the OF237A drainage basin are shown on Figures A-1a and A-1b, respectively. In 2021, there were no new BMPs installed on public or private properties in this drainage basin (see Table A.1-1). With future redevelopment in the OF237A drainage basin, more onsite treatment systems will be installed and over time these will help to decrease the solids load and the associated particulate-bound chemical load to the waterway.

South Tacoma Groundwater Protection District. Because the South Tacoma Groundwater Protection District falls within this basin, TPCHD also conducts construction and industrial/business inspections in this basin. As part of their inspection programs, stormwater treatment devices and other on-site BMPs are inspected for proper installation, maintenance, and operations. Improvements to stormwater quality discharging from these sites may be realized with proper maintenance and implementation of these BMPs. Per TPCHD, there were no significant corrective actions required during this reporting period.

Storm Line Cleaning. Between April 28 and August 8, 2008, targeted areas of the storm sewer system including trunk lines, laterals and CBs were cleaned and video inspected at a cost of \$374,000. Approximately 320 cubic yards of historical SSPM which had accumulated over 100 years was removed from 157,200 feet of lines and 754 catch basins using Tacoma's standardized cleaning practices (i.e., plugs downstream of vactor truck). The video inspections revealed a large void in the pipe at the intersection of South 26th Street and Jefferson Avenue. The City's Sewer Transmission Maintenance section and Streets and Grounds division repaired the storm pipe at this location.

The City's STRAP program is designed to visually inspect and rank the entire City storm conveyance system. The City maintains a map-based asset management database that helps guide our capital improvement program. Over time, video inspections have revealed eroded pipe segments, root intrusion and poorly constructed tap-in connections. A number of relining or replacement projects have been added to the City's list of Capital Improvement Projects from the STRAP program.

Since the time of the cleaning project in the OF237A basin, additional cleaning and maintenance has been performed in the basin in isolated areas. These cleaning and video inspection activities have been done for a variety of reasons, including areas identified as needing maintenance through the STRAP program, complaints, business inspection follow-ups,

etc. A summary of pipe cleaning and maintenance projects completed in the OF237A drainage basin during 2021 is provided in Table A.4-1 of Attachment A.4.

Enhanced Street Sweeping. In January 2007, the City’s street sweeping program was transferred from the Streets and Grounds division to the Sewer Transmission Maintenance section for continued implementation. The program was enhanced at that time in an attempt to reduce sediment buildup in the storm sewer system. The schedule was set to sweep all areas of the City twice per year, with more frequent sweeping in the business districts and on major arterials. The City also increased communications with residents and business owners, which helped raise awareness of the importance of the street sweeping program.

In 2007, when the work was transferred over, sweeping was done with a combination of mechanical and vacuum sweepers. In 2008, the City started the transition from mechanical sweepers to regenerative air machines. At this point in the program, the City used four regenerative air sweepers. In mid-2018 due to the end of usable life of one of the City’s regenerative air sweepers and a staff retirement, Tacoma temporarily reduced its street sweeping program. This resulted in Tacoma reducing the frequency of arterial sweeping to quarterly and residential streets to annually. The City will be purchasing additional equipment and staff to increase back to the higher sweeping frequency. The sweeper was purchased during 2021, however there are currently delivery delays. The expected delivery date is October 2022 – early January 2023. GPS is used to track the number of miles swept and the amount of material removed is recorded.

DA-1 Line/Coal Gas Site Cleanup. During construction of I-705, WSDOT installed a French drain to pick up surfacing groundwater that was affecting their construction of a road near South 23rd Street and South “A” Street. In 1992, it was determined that this drain was picking up coal tar contaminated groundwater and conveying it to the storm drain system, and subsequently to the waterway. The DA-1 line was thus believed to be a source of PAHs discharging to OF237A in the FD2A branch. The line was immediately plugged, and the site was partially remediated in May 2003. As part of this remediation in February and March 2003, WSDOT removed and sealed the DA-1 line French drain system that crossed through the Standard Chemical Site and its underlying coal tar deposits. In 2016, Ecology reconvened the group of Potentially Liable Parties to begin negotiation of the new Agreed Order for Remedial Action needed to complete work on the Coal Gasification Site, including this area. This new Agreed Order was executed in 2018 and work on the RI/FS is currently underway. PacifiCorp and Puget Sound Energy are working as the performing party in coordination with the City and WSDOT. Work with Ecology to gather additional sufficient information to complete the RI is ongoing. Upon completion, work on evaluation of cleanup alternatives can begin.

FD13 PAH Investigation / Media Filtration System Installation. In 2010, the City installed a media filtration system that treats stormwater from the FD13 sub-basin, which is approximately 50 acres in size. This Capital Improvement Project was funded by an Ecology Grant. When initially installed, this media filtration system appeared to remove almost all the SSPM from the stormwater as evidenced by the fact that a sample was not obtained from FD13 located downstream of the treatment device in WY2011. In WY2012, an SSPM sample from FD13 was obtained, and results for mercury, PCBs, PAHs, and phthalates were in the low range (see WY2021 Report, Figures 2-1.1 through 2-1.4). In WY2013, the sample was accidentally acidified in the laboratory prior to analysis, so no results are available for mercury, PCBs, PAHs, or phthalates. Since WY2014, PAHs and phthalates have been in the low range in FD13, and mercury and PCBs have not been analyzed. Based on these results, FD13 will be removed. The

media filtration system is inspected annually to determine the optimum maintenance cycle for the system.

When the treatment system was installed, it caused the upstream sediment trap (FD13B) to become submerged. In August 2012, when the sediment traps were redeployed for WY2013, a new sediment trap was installed upstream of that location. This new location is designated FD13B-New. Results are presented in this report for both upstream traps FD13B and FD13B-New, as well as for downstream trap FD13. Sediment trap FD13B was removed in 2018 and was not redeployed, so only results through WY2018 are provided for that location.

At FD13B, mercury concentrations were in the low range between WY2006 and WY2018 and PCBs were in the low range throughout the monitoring period and are no longer analyzed. Phthalate concentrations at FD13B were in the low range throughout the monitoring period with the exception of WY2013 when they were in the medium range. They returned to low levels in WY2014 and remained there through WY2018 when sampling at this location was discontinued. At FD13B-New, mercury and phthalate concentrations have been in the low range since monitoring began in WY2013, although there was insufficient volume for mercury analysis in WY2018 and WY2019. PCBs are not analyzed at this location.

PAH concentrations at FD13B were in the high range between WY2003 and WY2008, and then decreased to the medium range between WY2009 and WY2011. In WY2012, PAH concentrations decreased to the low range where they remained through WY2019. The submerged conditions in this trap need to be considered in analysis of this information since the samples do not represent the same conditions at other traps. PAH concentrations have fluctuated between medium and high-level concentrations at FD13B-New since the trap was installed in WY2013. The WY2018 PAH concentration at FD13B-New was in the medium range at 200,735 ug/Kg, a decrease from the high range concentration of 316,529 ug/Kg detected in WY2017. In WY2019 and WY2020, the concentrations increased slightly to 233,444 ug/Kg and 282,110 ug/Kg, respectively. Concentrations continued to exhibit a downward trend in WY2021 to 159,994 ug/Kg.

There has been an ongoing investigation in this portion of the OF237A drainage basin since 2005 to identify possible sources of PAHs found during sediment monitoring. Several source control activities have taken place in the area as described further in this section and below. While great strides were made to identify sources of PAHs during previous investigations, sediment trap monitoring results indicated a continued source of PAHs discharging from this sub-basin located upstream of the filtration system. In response, City staff began a new investigation to evaluate potential sources of PAHs in the FD13B-New basin during 2015 and it continued through 2021.

The first phase of the 2015 investigation was to determine whether the right-of-way (ROW) drainage area was a potential source of PAHs and to attempt to identify a specific area or private drainage system for additional source tracing efforts. Results from this phase showed an area with significantly higher PAH concentrations and subsequent sampling confirmed the presence of significant concentrations of PAHs throughout a parking lot on the Tacoma News Tribune (TNT) property

As a result of this finding, the City worked with the business owner and Ecology to develop a plan to address this contamination. In July 2016, it was confirmed that the cleanup plan had been implemented, and the City followed up with an outline for a plan for inspecting their private stormwater system quarterly. In October 2016, the municipal stormwater conveyance system

from the TNT property to the FD13B–New sediment trap was cleaned. The sediment trap was then reinstalled on October 4, 2016, after the cleaning was completed.

WY2017 sediment trap results were reviewed to assess whether PAHs are continuing to persist in this area. PAH results at FD13B-New remained in the high range, indicating an ongoing source of PAHs in this area. On October 31, 2017, City staff resampled several ROW catch basins in the FD13B-New drainage area that exhibited relatively elevated concentrations for PAHs during the 2015 investigation. While two of the 2017 samples exhibited slightly higher concentrations than measured in 2015, another sample located immediately adjacent to the TNT property exhibited a concentration more than double the concentration of the 2015 sample.

Based on these continuing elevated results, City staff conducted a business inspection at the TNT property and resampled several private catch basins that had exhibited elevated PAH concentrations during the 2015 investigation. Results from this sampling event indicate a continuing source of PAHs discharging from the TNT property. During the investigation, it was noted that several of the catch basins are not sealed properly and dirt is likely entering the catch basin from this pathway. Property owners sealed the catch basins and conducted cleaning of the targeted stormwater collection system.

On December 14, 2017, City staff installed two short-term sediment traps in the FD13B-New drainage basin to isolate flow discharging from the south/west and flow discharging from the north. Sediment trap A was installed to capture flow discharging from the south and the west while sediment trap B was installed to capture flow discharging from the north. These sediment samples were collected in January 2018. The purpose of the short-term sediment traps was to determine if there were other areas in the drainage basin discharging PAHs.

Results indicated some decreased but continued elevated concentrations on the TNT property. The City met with their representatives in early 2018 to discuss next steps. Additional maintenance of their onsite system was performed, and the property owner has committed to additional efforts as needed to control any ongoing issues. In addition, the City cleaned the stormwater system downstream from the TNT to remove historical pollutants, and the City will continue to monitor PAH concentrations in ROW catch basins downstream from the property when sufficient sediment has accumulated to determine whether source control strategies have been successful.

The City performed business inspections and an additional deployment of three short-term sediment traps in the FD-13B-New drainage basins to collect discharges from two discrete rainy seasons, winter and fall 2018, to determine whether other areas of concern were present. Results indicate the probability of additional sources in this area.

Investigations of private storm systems upstream of two of the short-term traps continued in 2021 in attempt to identify other potential sources. EC staff continued to study the map of this drainage area and discovered that an additional property has stormwater drainage to this system. The Franciscan Health center complex (2420 South State Street) has several catch basins on their property that have not been included in past investigations. On June 7, 2021, EC staff sampled all the catch basins located on the Franciscan property in addition to re-sampling the three catch basins at General Mechanical that were not accessible during the previous investigation. Elevated concentrations of PAHs were found in the catch basins at the southernmost parking lot on the Franciscan Health center complex property and the City required the property owner to clean the entire storm system at this site. This cleaning was completed on September 22, 2021. A quick inspection on November 19, 2021, showed that the

sediment level in these catch basins were insufficient for re-sampling. During 2022, staff will re-sample the catch basins located at the Franciscan properties to ensure that the contamination has been effectively removed. The City will continue to monitor the sediment trap results to determine if there are any additional sources of PAHs in this drainage area.

A copy of the OF237A 2021 Source Tracing Status Update – Polyaromatic Hydrocarbons (PAH) Investigation report is included in Attachment A.4.

FD10C Source Investigation. The FD10C sediment trap drainage area was initially tracked for several years as a potential phthalate concern. The annual sediment trap monitoring results showed moderately elevated phthalate levels since monitoring of this trap began in 2003. In addition, this trap had intermittent moderate to high level PCB concentrations, since 2013 and moderately elevated mercury concentrations in 2015 and 2016. Starting in 2011, phthalate concentrations began decreasing, coinciding with a large business closing in this area.

Due to these historic phthalate concentrations as well as the PCB detections, the stormwater system was cleaned in January 2014 to remove residual contamination. Following cleaning of the system, FD10C continued to show moderately elevated PCBs and mercury concentrations. As a result of these detections, an investigation was initiated in 2016 that included sampling of catch basins in the drainage area as well as performance of business inspections. Through this work, the area for additional investigation was narrowed down to a smaller area.

Two additional business inspections were conducted in 2017 to further explore the potential for ongoing source contributions. In addition, sediment samples were collected from private catch basins discharging to the City's stormwater collection system. This phase of the source tracing investigation was intended to identify possible sources of PCB and mercury contamination as well as PAHs and phthalates which were included based on the annual sediment trap monitoring results.

Although a specific source of the contamination was not identified through this investigation, some private stormwater systems and City catch basins upstream from the sediment trap were cleaned with a plan to resample in 2018 to determine if there was a historical component to the contamination.

During 2018, one additional business inspection was conducted, and sediment samples were collected and analyzed from one private catch basin and one City catch basin. The analytical results indicated detectable concentrations for PAHs and phthalates and minor concentrations for PCBs and mercury. Sediment was cleaned from all the City's collection pipes in 2018 to remove historical sediment from the lines.

In 2019 the City continued efforts to get permission from the private property owner at 3033 South Lawrence to collect sediment from their private stormwater oil water separator. Since these efforts were not successful, short term sediment traps were redeployed to try to get a sample of material leaving the site. These results showed moderately high levels of PAHs and low levels of phthalates and PCBs. The City wrote a letter on February 28, 2020, to the owner of 3035 South Lawrence Street requesting that they clean their oil/water separator: a follow-up inspection on July 6, 2020, confirmed that it had been cleaned.

In 2021, a short-term sediment trap was installed at the connection point of the 3035 South Lawrence Street private system and oil/water separator. The purpose was to determine if the source of contaminants entering the municipal system had been removed after the cleaning of the oil/water separator at this location. Those results show small concentrations of PAHs, but no

PCBs were detected. Additionally, four private catch basins were sampled along Lawrence Street that previously showed low concentrations of PCBs. These catch basins continue to exhibit relatively low concentrations of PCBs compared to annual sediment trap concentrations and it is unlikely that this property is the source of the contamination. During 2022, staff will confirm that the private systems in this basin are accurately represented on the City's mapping system. Since the sediment trap results in this basin continue to exhibit medium PCB concentrations and no additional sources have been identified, there is a possibility of unidentified discharges to the storm system. Any newly discovered private collection systems will be mapped and sampled in 2022.

A copy of the OF237A Source Tracing Status Update – PCB, Mercury, and Polycyclic Aromatic Hydrocarbons Investigation in FD10C report is included in Attachment A.4.

2013 Stormwater Pipe Retrofit Project. From July 18 through November 15, 2013, 5,126 linear feet of existing storm sewer main, 31 segments, was structurally rehabilitated in asset management area FS07. The segments that were rehabilitated in OF237A ranged in size from 8 inches to 18 inches in diameter. Defects (cracks, holes, etc.) in the aging system could allow groundwater and soil (potentially contaminated from historic “hot spots”) to enter the system and ultimately discharge to the Thea Foss Waterway. Rehabilitation of the existing main segments was accomplished by means of Cured-In-Place Pipe (CIPP) construction technologies. Resin impregnated liners were inserted into the main segments through existing manholes and the liner was then pressurized causing it to expand and form to the inside of the existing main segment. A source of heat was then applied which caused the resins to catalyze. The result was a new pipe within the existing pipe that has similar strength and durability characteristics of PVC pipe. It is anticipated that these projects will also result in improvements in water and SSPM quality.

When properly installed, the CIPP liner results in continuous stormwater pipe segments with no joints (except for manhole connections), that are free of leaks associated with structural defects. The resulting reduction in inflow and infiltration may reduce the contaminant load to waters of the state if contaminated groundwater is present. Final project costs are approximately \$1,048,158 which includes all work completed in asset management areas FS05, FS06 and FS07.

Prior to installation of the CIPP liner the main line was thoroughly cleaned to remove all debris and to verify if the segment could be retrofitted using the CIPP construction technology. In FS07, 34 segments, 5,666 linear feet of pipe, were cleaned and video inspected between July 11 and October 28, 2013. During cleaning, the main line was plugged, and the cleaning water and material was removed from the main using a vactor truck. The cleaning water and entrained sediment was pumped into a sediment removal system to separate the solids from the water. After filtration the water was discharged into the sanitary sewer. Approximately 10 tons of material was removed from the main segments cleaned in asset management areas FS05, FS06 and FS07.

Key Bank LUST Removal. Following identification of a LUST, the owner of this site completed a voluntary cleanup under Ecology oversight in 2007. A return fuel line from a back-up generator had ruptured and leaked diesel into surrounding soils and eventually seeped into a catch basin that drains to FD13B.

UST and LUST Removal. TPCHD is currently overseeing the removal of USTs and LUSTs at several sites in the drainage basin (see Attachment A.1) including:

- USTs at the Foremost South site located at 2413 Pacific Avenue South. Permits for a total of ten USTs were renewed in July 2021. These permits are currently active.
- USTs at the Nalley's Fine Foods/Bird's Eye Site located at 3303 S. 35th St. Contaminated soil and groundwater are present at this site and monitoring wells are in place. A removal action was taken in 1990. The permit was renewed in February 2021 and remains active.
- UST at Halladay Auto Repair located at 601 South 38th St. Contaminated groundwater is present and monitoring wells are in place. The permit was renewed in August 2021 and remains active.
- UST at the Ray F Snider Company (Tacoma CFN) located at 3224 South Tacoma Way. Contaminated soils and contaminated groundwater are present at the site, and monitoring wells are in place. The permit application was renewed in October 2021 and remains active.
- USTs at Superior Linen Service located at 1012 Center Street. Contaminated soils and contaminated groundwater are present at the site, along with seven tanks, and monitoring wells are in place. The permit was renewed in May 2021 and remains active.
- UST at 56th and Park LLC located at 5602 South Park Avenue. Contaminated soils are present at the site. The permit was renewed in May 2021 and remains active.
- UST permit for Roger Smith located at 2718 Pacific Avenue. Four tanks are present and was renewed in October 2021. The permit is active.
- UST at the Monitor Company at 3000 South Alaska St. A removal action was taken in 1993. The permit was renewed in March 2021 and remains active.
- USTs at the Tacoma Housing Authority located at 602 S Wright Avenue. The permit was renewed in September 2021 and remains active.
- USTs at the Crittendon Property located at 2155 Martin Luther King Jr. Way. Permits were renewed in February 2021 and closed in August 2021.
- UST at the Shell 405 station located at 2631 S. 38th St. The permit was issued on September 23, 2021 and remains open and awaiting cleanup. Cleanup actions required remediation of soil and groundwater contamination. In particular, groundwater is significantly contaminated. The site is higher risk, given its location within the South Tacoma Groundwater Protection District.
- LUST at the American Linen Tacoma site located at 2011 S TACOMA WAY. This permit was closed during 2021 and received satisfactory Site Closure determination after completion of underground storage tank (UST) removal and associated cleanup action.

Notice of Violation and Warning Letters. Two warning letters were issued in this drainage basin in 2021:

A warning was issued on March 2, 2021 to Sprague Shell Mini Mart at 1401 S Sprague Ave. for not maintaining the private stormwater system and control structure. The other warning letter was issued to Patriot Fire Protection, Inc. at 3701 South Cedar for an illicit discharge of a process wastewater to the City's municipal storm system.

A.5 OUTFALL 237B

A.5.1 OUTFALL 237B DRAINAGE BASIN

The OF237B drainage basin encompasses 1,991 acres of south and east Tacoma. This area drains to the Thea Foss Waterway through a 96-inch outfall pipe located on East Dock Street at the head of the waterway. The general basin boundaries are East 23rd Street and East Dock Street to the north, East 84th Street to the south, South Fawcett Avenue to the west, and McKinley Avenue to the east. Most of the storm drainage is channeled to the main trunk line, which flows south to north along East “D” Street.

Primary land use in this drainage basin is residential with some commercial and a very small industrial area (see WY2021 Report, Figure 1-3). Commercial areas are mostly linear and spread out in strips along Pacific Avenue and McKinley Avenue with some areas around I-5 to the Thea Foss Waterway. Freeway right-of-way makes up a small percentage of this basin, and includes a portion of the I-5, I-705, Highway 7 interchange and Highway 7. This right-of-way area may increase slightly with the expansions and HOV lanes on I-5. Streets, parks, and open or undeveloped property account for the remaining land use in the basin.

Baseflow from OF237B is continuous at approximately 8.3 cubic feet per second (see Appendix B, Table B2-2) and originates primarily from former creeks that were piped. Sources of baseflow are discussed in more detail in Appendix B.

As part of the BNSF railroad realignment project, OF237B was reconstructed between July and September 2005. This work included installation of a new manhole structure downstream of the whole-water and SSPM (FD1) sampling location and included extension of the outfall pipe through installation of 60 feet of new concrete pipe. The SSPM and the whole-water monitoring station remained at the same location since that location captures contributions from the entire basin.

A.5.2 2002-2021 SOURCE CONTROL ACTIVITIES

Since 2002, significant work has been accomplished in the OF237B drainage basin including intense business inspections, targeted line cleaning, and identification and removal of point sources. A discussion of specific major source control activities is provided in the following paragraphs.

As part of the City-wide inspection program, 29 inspections were completed in the OF237B drainage basin in 2021. Business inspections provide source control through education and through implementation of nonstructural BMPs. These actions help prevent materials from coming into contact with stormwater and help promote activities that reduce pollutants in stormwater.

Stormwater treatment devices currently in place also remove solids and the associated particulate-bound chemicals from stormwater. The locations of private and public onsite stormwater treatment devices in the OF237B drainage basin are shown on Figures A-1a and A-1b, respectively. In 2021, there were four new infiltration BMPs were installed on private properties in this drainage basin (see Table A.1-1). With future redevelopment in the OF237B drainage basin, more of these onsite treatment systems will be installed and over time they will help to decrease the solids load and the associated particulate-bound chemical load to the waterway.

FD31 PAH Investigation. HPAHs were found in baseflow in WY2004 (see WY2012 Report, Figures G-19a and G-39a). As shown in Figure 2-1.2 of the WY2021 Report, FD31 PAH concentrations in SSPM in WY2003 were considered to be in the medium range (yellow). In 2004-2005, source control inspectors performed a source tracing investigation and identified two sources of PAHs in the FD31 branch of the OF237B drainage: an existing 1950s underground storage tank (UST) for heating fuels at Tacoma Public Schools Willard Staff School; and a neighborhood fueling station which had recently closed. The City cleaned and video inspected the FD31 branch as part of the PAH source tracing investigation. Source control inspectors worked with the school district's maintenance staff to implement proper BMPs for the site.

Because of these efforts, PAH concentrations decreased in FD31 to the low range of concentrations in WY2005 (see WY2021 Report, Figure 2-1.2). However, PAH concentrations at FD31 increased back to medium range starting in WY2008 and to the high range in WY2010. As a result of the known presence of USTs, these sites were referred to TPCHD for follow up.

In December 2011, the UST at Tacoma Public Schools Willard Staff School was removed in accordance with a TPCHD permit. TPCHD considered the work completed and closed on October 22, 2012. In response to the elevated PAH concentrations at the former fueling station at 3402 Pacific Avenue (EZ Food Mart), TPCHD initiated a Phase I/II assessment in 2011. TPCHD determined that the site had improperly abandoned USTs which needed to be removed. They began working with the property owner to remove these USTs, but the work was delayed for two years until cleanup was finally completed in 2014. The Site Closure determination was issued by TPCHD on August 6, 2014.

Because sediment trap concentrations were in the medium range at this location in WY2013, and due to the lack of progress in removing the USTs at the EZ Food Mart site, the City initiated additional source tracing efforts for PAHs in this sub-basin in 2014 to identify any other sources of PAHs present in this area. The approach for this investigation was to sample individual catch basins in the targeted drainage area in an attempt to identify any specific catch basins with elevated levels of PAHs. During the initial investigation, it was discovered that the stormwater collection system in this area was cleaned in February 2014. Because of this, insufficient sediment was present for sampling until September 2014. Five catch basins were sampled at that time, and none showed detectable levels of PAHs.

PAH concentrations in FD31 were in the medium range in WY2014 but decreased to low levels in WY2015 where they have remained through WY2019. With the cleaning of the drainage system and the removal of the USTs at the EZ Mart site, it appears that the elevated PAH levels found in the stormwater system were the result of these historic sources at the Willard Staff School and EZ Mart, and that control of these sources has eliminated this source. While in the low range, the WY2018 concentration at FD31 of 159,791 ug/Kg represented an increase from the WY2017 concentration of 66,262 ug/Kg. Concentrations have continued to fluctuate at this sampling location with a decrease in PAH concentration to 50,323 ug/Kg in WY2019 and a slight increase in concentration to 91,139 ug/Kg in WY2020. Despite the fluctuations, concentrations have remained comparatively low indicating that source control work was effective. Therefore, the FD31 sediment trap was removed in WY2020.

PCB Source Tracing in FD34 and FD35. Since 2005, PCBs were found intermittently at high range concentrations in the south-central portion of the OF237B drainage basin at FD34 and FD35 (see WY2021 Report, Figure 2-1.4). Through the years, numerous source control activities were undertaken in attempt to identify the source of this ongoing intermittent issue. In

the summer of 2011, source control inspectors initiated an investigation to isolate possible source(s) of PCBs in the area. Sediment and soil samples were also collected from a catch basin and from the ground adjacent to a transformer on the property of the former Globe Ticket Facility. PCBs were not detected in any of these samples.

In an attempt to remove any legacy contamination, the City completed a stormline cleaning project in the summer of 2011 that covered the majority of the OF237B drainage basin, including the FD35 area. In WY2011, concentrations in both sediment traps dropped to below levels of concern. However, in WY2012 and WY2013, the PCB concentrations in FD35 increased back to high levels, while the concentrations in FD34 remained low. In WY2014, concentrations at FD35 decreased to medium levels, but increased back to the high range in WY2015, while remaining in the low range in FD34.

Another source tracing investigation to try to narrow the source of PCBs in this area was initiated in late 2012. Initial results narrowed the source to one leg of the drainage system leading to FD35. The results from the Phase 1 investigation were included in the WY2012 Report. Substantial additional work was performed in 2013 to further isolate the source of the contamination in this leg of the drainage system. Ultimately it was determined that the source of the contamination was a material used during construction of the roadway in the area in 1975, specifically the sealant used to seal the roadway at the curbline that likely contained PCBs. The final report on this investigation was included in the WY2013 report.

On May 22, 2013, the City sent formal letters of notification to Ecology outlining the discovery of the PCBs in the City's stormwater conveyance system. In 2015, the City completed the first phase of roadway repair to eliminate this source of PCBs and completed the second and final phase in fall 2016. FD34 remained in the low range in WY2019, and that sediment trap will be removed. FD35 decreased from the medium range in WY2017 to the low range in WY2018 where it remained in WY2019. FD35 was in place in the pipe during the time that the remediation project was being completed. Therefore, the WY2018 sample was the first representing a full year of the area in its remediated condition. WY2019 PCB concentrations in FD35 remained in the low range (94 µg/kg), however WY2020 concentrations increased back to the medium range (250 µg/kg). FD35 remained in place during WY2021, and no PCBs were detected. Since concentrations have remained low and the WY2020 results were considered inaccurate¹, the source control action is considered successful and the sediment trap at this location will be removed.

Storm System Cleaning. At a cost of \$274,200, the majority of the municipal storm drainage basin for OF237B was cleaned and video inspected by the City's Transmission Maintenance crews between November 7, 2010 and February 24, 2011. Fifty to 100 years of accumulated historical stormwater particulate matter was present in the trunk lines and laterals. During the cleaning project 175 cubic yards were removed from 144,199 feet of lines and laterals and 1,072 catch basins. The cleaning was performed using Tacoma's standardized cleaning practices (i.e., plugs downstream of vactor truck).

¹ During WY2020 SSPM results showed consistently higher levels of PCBs wherever they were detected. Because these higher concentrations were dispersed across several locations and drainage basins, it did not appear to be caused by a specific event or source. While a cause for these elevated concentrations was not identified during the investigation, based on the lower expected results exhibited during WY2021 it was determined that WY2020 results were not accurate.

The 2011 video inspection also revealed eroded pipe segments and other pipes drilled through the storm lines in some areas. These issues will be addressed as part of future Capital Improvement Projects. Since the time of the complete cleaning of the OF237B basin, additional cleaning has been performed in the basin in isolated areas. These cleaning and video inspection activities have been done for a variety of reasons, including areas identified as needing maintenance through the STRAP program, complaints, and business inspection follow-ups.

A summary of pipe cleaning and maintenance projects completed in the OF237B drainage basin during 2021 is provided in Table A.5-1 in Attachment A.5.

Enhanced Street Sweeping. In January 2007, the City's street sweeping program was transferred from the Streets and Grounds division to the Sewer Transmission Maintenance section for continued implementation. The program was enhanced at that time in an attempt to reduce sediment buildup in the storm sewer system. The schedule was set to sweep all areas of the City twice per year, with more frequent sweeping in the business districts and on major arterials. The City also increased communications with residents and business owners, which helped raise awareness of the importance of the street sweeping program.

In 2007, when the work was transferred over, sweeping was done with a combination of mechanical and vacuum sweepers. In 2008, the City started the transition from mechanical sweepers to regenerative air machines. At this point in the program, the City used four regenerative air sweepers. In mid-2018 due to the end of usable life of one of the City's regenerative air sweepers and a staff retirement, Tacoma temporarily reduced its street sweeping program. This resulted in Tacoma reducing the frequency of arterial sweeping to quarterly and residential streets to annually. The City will be purchasing additional equipment and staff to increase back to the higher sweeping frequency. The sweeper was purchased during 2021, however there are currently delivery delays. The expected delivery date is October 2022 – early January 2023. GPS is used to track the number of miles swept and the amount of material removed is recorded.

UST and LUST Removal. TPCHD is currently overseeing the removal of USTs at two properties in this drainage basin (see Attachment A.1) including:

- UST at Erickson Autobody Repair/Hi Tech Erickson LLC located at 4006 Pacific Avenue. The permit was renewed in November 2021 and remains active at this time.
- UST at a vacant property located at 3319 Pacific AVE. One tank was removed from this property and the permit was closed in June 2021.

Notice of Violation and Warning Letters. One warning letter was issued to the following party in this drainage basin in 2021:

- A warning letter was issued on February 1, 2021 to Peach Tree Apartment at 901 E 72nd Street for failure to maintain their private stormwater system. The business owner was required to complete the required maintenance.

A copy of this letter is included in Attachment A.5.

A.6 OUTFALL 243

A.6.1 OUTFALL 243 DRAINAGE BASIN

The OF243 drainage basin is 59 acres and discharges to the east side of the waterway at East 21st Street through a 42-inch outfall (see WY2021 Report, Figure 1-3). The storm drainage is carried in two main laterals, one south to north on East “D” Street from East 26th Street to East 21st Street and the second east to west on East 21st Street. The majority of runoff in this basin is from BNSF property and the portion of SR-509 between Portland Avenue and the Thea Foss Waterway. Land uses in the basin are primarily industrial, with some commercial at the west side of the basin and some highway with SR-509.

The outfall has a tide valve which was originally installed in 1999 then reinstalled in 2001 when the outfall pipe was extended. In 2008, “D” Street was raised over the BNSF main line increasing the drainage area by ½ acre. The stormwater runoff from the new ½ acre is treated through a VortFilter unit which then discharges to OF243 through a new 15-inch pipe.

Baseflow from OF243 is continuous at approximately 0.4 cubic feet per second (see Appendix B, Table B2-2) and originates primarily from tidal backflushing. Sources of baseflow are discussed in more detail in Appendix B.

A.6.2 2002-2021 SOURCE CONTROL ACTIVITIES

Since 2002, significant work has been accomplished in the OF243 drainage basin including removal of significant sources. A discussion of specific major source control activities is provided in the following paragraphs.

As part of the City-wide inspection program, two business inspections were completed in the OF243 drainage basin in 2021. Business inspections provide source control through education and through implementation of nonstructural BMPs. These actions help prevent materials from coming into contact with stormwater and help promote activities that reduce pollutants in stormwater.

Stormwater treatment devices currently in place also remove solids and the associated particulate-bound chemicals from stormwater. The locations of private and public stormwater treatment devices in the OF243 drainage basin are shown on Figures A-1a and A-1b, respectively. No new public or private treatment BMPs were installed in this drainage basin in 2021. With future redevelopment in the OF243 drainage basin, more onsite treatment systems will be installed and over time they will help to decrease the solids load and the associated particulate-bound chemical load to the waterway.

A summary of pipe cleaning and maintenance projects completed in the OF243 drainage basin during 2021 is provided in Table A.6-1 of Attachment A.6.

Redevelopment of the Area. In 2002 and 2003, Pick’s Cove Marina (now Foss Landing Marina) and American Plating were remediated. These sites were sources of mercury and DEHP (Pick’s Cove) and metals (American Plating). In addition, the “D” Street Grade separation/bridge was completed in 2008 and stormwater from the new impervious surfaces (0.49 acres) were routed through a treatment system.

SR509 WSDOT Pond Black Oil/Tar Releases. Historically, black oil/tar emanating from the old Northern Pacific Rail yard oil pipeline was found in the SR-509 WSDOT stormwater treatment pond located within this drainage basin. In 2002, the pond was rebuilt to remediate the black oil/tar. In 2009, the pond was again remediated as directed by Ecology when the entire length of the Northern Pacific Rail yard oil pipeline along East “D” Street and East 19th Street was cleaned up.

Outfall 243 Mercury Source Tracing. Mercury has been found in the medium to high range of concentrations in all samples analyzed from FD23 since WY2002 (see WY2021 Report, Figure 2-1.1). Results have been in the medium range since WY2007, and the WY2018 concentration was 0.661 mg/Kg, which was the highest concentration detected at this location since WY2006. The WY2019 concentration decreased to 0.2830 mg/Kg.

Based on these results, a source control investigation was initiated in 2008. Stormwater sediment samples were collected at several locations in the basin and analyzed for Foss parameters. On May 28, 2009, four sediment samples were collected from portions of the system that represent independent and comingled branches of the storm sewer system. Mercury concentrations found in these samples (0.129-0.54 mg/kg) are comparatively similar to the mid-range of concentrations (yellow in color) as represented in Figure 2-1.1 with no likely point-source of mercury for any one of the branches.

Over the next ten years, the investigation continued, with a focus on the BNSF property and the WSDOT pond. Sources were not identified, but significant work was done on the BNSF and LRI properties to clean and map their drainage systems. Detectable mercury was found but levels did not suggest a significant source.

In 2018, the City continued investigations in this drainage basin and conducted additional business inspections at BNSF, LRI, and Berg, the three main businesses discharging to the FD23 sediment trap. During the inspections, no signs of mercury contamination were discovered.

In 2019, while reviewing past investigations and the extents of the drainage basin it was discovered that a small portion of this drainage basin was not included in previous investigations. The City sampled various catch basins in May 2019 throughout the previously un-sampled segment. The majority of the sampling results exhibited minimal concentrations of mercury with the exception of one catch basin with an elevated mercury concentration. Based on these results, a follow up investigation took place in June 2019. Samples were collected from the gutter-lines discharging to the contaminated catch basin as well as the curb drains coming from the building. These sample results for mercury ranged from 1 mg/Kg to 12.8 mg/Kg, the highest of which came from the roof drain coming from 414 Puyallup Avenue. This roof drain was blocked with debris which allowed sediment buildup. The catch basin, curb-line, and roof drain were cleaned in October 2019.

The City resampled the catch basin that contained the elevated mercury concentration to determine whether this source has been successfully removed or if there is an ongoing mercury issue in this area. The catch basin sediment continued to exhibit elevated concentrations of mercury. During 2021, the city worked with the property owner to ensure the roof drains were adequately cleaned, and subsequently re-cleaned the catch basin and the curblines on October 8, 2021. One of the FD23 sediment traps was installed after this date to align with the catch basin cleaning in this area. During 2022 staff will resample the identified catch basin to determine if there is still an ongoing mercury issue at that location

A copy of the OF243 Source Tracing Status Update – Mercury Investigation is FD23 is included in Attachment A.6.

Enhanced Street Sweeping. In January 2007, the City’s street sweeping program was transferred from the Streets and Grounds division to the Sewer Transmission Maintenance section for continued implementation. The program was enhanced at that time in an attempt to reduce sediment buildup in the storm sewer system. The schedule was set to sweep all areas of the City twice per year, with more frequent sweeping in the business districts and on major arterials. The City also increased communications with residents and business owners, which helped raise awareness of the importance of the street sweeping program.

In 2007, when the work was transferred over, sweeping was done with a combination of mechanical and vacuum sweepers. In 2008, the City started the transition from mechanical sweepers to regenerative air machines. At this point in the program, the City used four regenerative air sweepers. In mid-2018 due to the end of usable life of one of the City’s regenerative air sweepers and a staff retirement, Tacoma temporarily reduced its street sweeping program. This resulted in Tacoma reducing the frequency of arterial sweeping to quarterly and residential streets to annually. The City will be purchasing additional equipment and staff to increase back to the higher sweeping frequency. The sweeper was purchased during 2021, however there are currently delivery delays. The expected delivery date is October 2022 – early January 2023. GPS is used to track the number of miles swept and the amount of material removed is recorded.

Street Sweeping Pilot Project. OF243 and OF245 have shown somewhat elevated levels of lead and zinc in both stormwater and baseflow relative to other drains. It is theorized that this may be due to the increased amount of trucking in this industrial area. Based on these results, the City initiated a pilot program in WY2014 to determine whether an increased frequency of street sweeping in this area would have an effect on these results. Starting on October 1, 2013, the City began sweeping the ROW within the OF243 and OF245 drainage basins at a frequency of once every two weeks rather than the usual frequency of once per month for industrial areas.

The pilot project continued in WY2021. With several years of data available, statistical analysis of the effectiveness of this enhanced sweeping schedule was done for the first time in WY2017 and is included again in this report. Results will be more statistically robust as additional data becomes available. Results of this analysis are presented in Section 5 of the WY2021 Stormwater Monitoring Report.

UST and LUST Removal. TPCHD is currently overseeing the removal of the following USTs in this drainage basin (see Attachment A.1) including:

- UST at Industrial Tire Service located at 423 Puyallup Ave. There are two active permits at this location due to contaminated soil. Permits were renewed in August 2021.

Notice of Violation and Warning Letters. There were no Warning or Notice of Violation letters issued in this drainage basin in 2021.

A.7 OUTFALL 245

A.7.1 OUTFALL 245 DRAINAGE BASIN

The OF245 drainage basin is located in the Tideflats of Tacoma on the southern portion of the east side of the waterway. Basin boundaries are shown on Figure 1-3 in the WY2021 Report. The outfall is located at East 19th Street, just south of Johnny’s Dock Restaurant. The drainage area is approximately 39 acres in size and the main trunkline of the storm drainage system extends east from the Thea Foss Waterway, down East 19th Street to East “I” Street.

Because of the low basin elevation, the entire storm system is influenced by saltwater at high tide. Baseflow from OF245 is continuous at approximately 0.1 cfs (see Appendix B, Table B2-2) and originates primarily from tidal backflushing. Sources of baseflow are discussed in more detail in Appendix B.

Land use in this basin is primarily industrial with the restaurant providing a small commercial area at the west side of the basin. Most facilities in the drainage basin are engaged in storage, transloading and warehousing of materials and products, and manufacturing.

Directly upstream of the outfall is a deep bottom sump manhole known as MH390 (see Appendix B, Figure B2-4). MH390 is 60 inches (inside diameter) and approximately 18 feet in depth with the inlet pipe and outlet pipe at 55.5 inches above the bottom. A plastic tide gate (swing valve) is located on the inlet pipe. The tide gate does not securely seal, and some tidal water does get into the upper reaches of the system. In fall 2004, the last 24 feet of pipe from MH390 to the waterway was replaced with HPDE. Drainage from MH390 was improved with the new slope of the outfall pipe, which replaced the old line that had a sag in it.

In August 2004, Tacoma replaced a 300-foot segment of the stormwater line and associated laterals in East 19th Street. This action sealed this segment from groundwater, sediment and product migration from the surrounding contaminated soil that remained in-place after an interim action remediation project was completed in this area.

Several of the businesses in the area not only discharge stormwater to OF245, but also discharge stormwater to adjacent outfalls, OF248 and OF249. Source control activities for all these basins are discussed in the following subsections.

A.7.2 2002-2021 SOURCE CONTROL ACTIVITIES

Since 2002, significant work has been accomplished in the OF245 drainage basin including removal of significant sources. A discussion of major source control activities associated with these areas is provided in the following paragraphs.

As part of the City-wide inspection program, two business inspections were completed in the OF245/OF248 drainage basin in 2021. Business inspections provide source control through education and through implementation of non-structural BMPs. These actions help prevent materials from coming into contact with stormwater and help promote activities that reduce pollutants in stormwater.

Stormwater treatment devices currently in place also remove solids and the associated particulate-bound chemicals from stormwater. The locations of private and public stormwater treatment devices in Basins 245/248/249 are shown on Figures A-1a and A-1b, respectively. No new public or private treatment BMPs were installed in this drainage basin in 2021. With future

redevelopment in the OF245 drainage basin, more of these onsite treatment systems will be installed and over time they will help to decrease the solids load and the associated particulate-bound chemical load to the waterway.

A summary of pipe cleaning and maintenance projects completed in the OF245/248 drainage basins during 2021 is provided in Table A.7-1 of Attachment A.7.

MH390/Outfall 245 Black Oil/Tar Releases. At the beginning of the monitoring program, black oil and tar-blobs were observed seeping into the storm drains through joints and cracks. Before the extent of the contamination was understood, Tacoma completed three maintenance projects (two-line replacements and one relining) to alleviate this issue. After these projects were complete, seeps continued to leak into the storm drain system. Further investigations found contamination along the entire length of the old Northern Pacific Rail yard oil pipeline area along East “D” Street and East 19th Street. Ecology ordered remediation of the pipeline in 2008 and 2009. During this period, five UST/LUSTs were also removed or filled.

After completion of all these activities, oil absorbent snares placed in the storm lines remained clean. Use of the oil snares in this basin was discontinued in 2010.

Former MPS Site Investigation. OF245 (as evidenced by sediments in MH390) exhibited a notably different phthalate composition in the stormwater sediments in comparison to other outfalls and has relatively higher concentrations of butylbenzylphthalate. This difference is much less pronounced when looking at only the last five years of data. Early in the monitoring program, butylbenzylphthalate concentrations in OF245 were among the highest of any reported phthalates (see Tables 3-3.1 and 3-3.2 and boxplots in Appendix F of the WY2021 Report), although levels are much reduced at this time. WY2012 through WY2019 SSPM results for FD21 and MH390 showed that phthalates were in the low range, while for FD22 they were in the medium range in WY2013 but returned to the low range in WY2014 and have remained there since that time.

This site has operated under the name of MPS, Quality Transport, and currently as Truck Rail Handling. In 1997 and in 2000, Quality Transport, Inc., the owner at the time, cleaned a majority of their system with no effect on the sediment trap phthalate concentrations downstream of their facility. Average total phthalate concentrations show a peak in WY2003 with a decline in stormwater and baseflow chemistry in WY2004 and WY2005 (see WY2021 Report, Figure 5-1.6). Baseflow concentrations appeared to remain generally stable between WY2005 and WY2011¹ while, stormwater concentrations decreased or remained stable until WY2014 with slight increases seen in the last several years.

Because of the intermittent medium to high SSPM concentrations at FD22 until WY2013, this site was referred to Ecology and TPCHD for follow-up while the City continued to monitor the site for wastewater discharges. The site was re-mapped in 2012 as a result of that work. Through that mapping and inspection effort, the presence of a dry well was identified on-site. Additional follow up from all involved agencies remained needed to fully assess the operations and site conditions at this property. Joint inspections at the property have occurred and follow up actions were required. While some work was completed in 2015, there were some delays in fully addressing the environmental concerns due to issues with some in lieu of assessment fees.

¹ Baseflow monitoring was discontinued in WY2011 since baseflow was well characterized.

After some discussion the City reduced the amount of the assessment from approximately \$55,000 to approximately \$29,000, however, the property owner declined that offer.

In 2016, City EC staff revisited the site, now operating as Truck Rail Handling, along with the City's wastewater pretreatment permit manager to conduct an additional in-depth inspection and collect additional samples. Several issues with both the wastewater and stormwater systems on the site were identified. While many of these issues were successfully resolved during 2016, the City continues to work with the property owner to develop and implement a long-term maintenance plan for the facility, site BMPs and an accurate map of the private stormwater and wastewater systems to prevent future discharges of contaminants from the site. With decreased phthalate levels in the sediment traps, it appears that efforts to date have been effective in addressing the issues at this site. The City will continue coordination with the property owner, and sediment traps will continue to be monitored for now to ensure that levels remain at the reduced levels.

Petroleum Spills in Basins 245, 248 and 249. One of the trucking warehouses in the basin, SuperValu, was fined for repeated petroleum spills to the waterway in 2007 through OF245, OF248 and OF249. As a result, they are under an order from Ecology to implement BMPs. In 2010, SuperValu installed three oil/water separators and have implemented spill response BMPs as required by Ecology. Another oil/water separator was installed in 2011. In 2013, SuperValu installed a StormFilter treatment system on their property. These actions should reduce contributions of TPH and other petroleum related chemicals from this facility.

As a result of several inspections performed at the site in recent years, SuperValu reached a settlement with EPA under which it was issued a penalty in 2015 of \$120,000 in part for violations at two sites discharging to the Thea Foss Waterway through OF248 and OF249. The enforcement action was based on SuperValu's failure to comply with the conditions of their NPDES Permit.

Anhydrous Ammonia Spill in Basin 245. On June 7, 2017, there was a spill of anhydrous ammonia at the SuperValu site in this drainage basin. The release resulted from a leak from a valve and piping of a system used to keep a food warehouse refrigerated. When the leak was discovered by the business owner, the leak was isolated by closing valves upstream and downstream of the leak site. The leaking ammonia valve was connected, via a hose, outside the facility to allow the charged pipe to purge the leaking ammonia. Purging the ammonia was necessary to allow repair to the leaking valve. The ammonia purge hose was connected to a mixing valve which was also connected to a water source. The ammonia and water were then mixed and allowed to flow over an asphalt parking lot to an onsite storm drain. The storm drain is connected to an oil/water separator and then to a sand filter designed to remove oil and zinc. After the water and ammonia mixture flowed through the sand filter, the solution was discharged directly to the City of Tacoma storm sewer which leads to MH390 and OF245. The volume of discharged ammonia and/or ammonia/water solution was estimated at 24 gallons, but the amount entering the waterway is unknown. The system was pumped to remove solids and liquids from the drainage system.

Enhanced Street Sweeping. In January 2007, the City's street sweeping program was transferred from the Streets and Grounds division to the Sewer Transmission Maintenance section for continued implementation. The program was enhanced at that time in an attempt to reduce sediment buildup in the storm sewer system. The schedule was set to sweep all areas of the City twice per year, with more frequent sweeping in the business districts and on major

arterials. The City also increased communications with residents and business owners, which helped raise awareness of the importance of the street sweeping program.

In 2007, when the work was transferred over, sweeping was done with a combination of mechanical and vacuum sweepers. In 2008, the City started the transition from mechanical sweepers to regenerative air machines. At this point in the program, the City used four regenerative air sweepers. In mid-2018 due to the end of usable life of one of the City's regenerative air sweepers and a staff retirement, Tacoma temporarily reduced its street sweeping program. This resulted in Tacoma reducing the frequency of arterial sweeping to quarterly and residential streets to annually. The City will be purchasing additional equipment and staff to increase back to the higher sweeping frequency. The sweeper was purchased during 2021, however there are currently delivery delays. The expected delivery date is October 2022 – early January 2023. GPS is used to track the number of miles swept and the amount of material removed is recorded.

Street Sweeping Pilot Project. OF243 and OF245 have shown somewhat elevated levels of lead and zinc in both stormwater and baseflow relative to other drains. It is theorized that this may be due to the increased amount of trucking in this industrial area. Based on these results, the City initiated a pilot program in WY2014 to determine whether an increased frequency of street sweeping in this area would have an effect on these results. Starting on October 1, 2013, the City began sweeping the ROW within the OF243 and OF245 drainage basins at a frequency of once every two weeks rather than the usual frequency of once per month for industrial areas.

The pilot project continued in WY2021. With several years of data available, statistical analysis of the effectiveness of this enhanced sweeping schedule was done for the first time in WY2017 and is included again in this report. Results will be more statistically robust as additional data becomes available. Results of this analysis are presented in Section 5 of the WY2021 Stormwater Monitoring Report.

UST and LUST Removal. TPCHD was overseeing the removal of the following USTs in this drainage basin during 2021 (see Attachment A.1):

- UST at the Former Supervalu site located at 1525 E D Street. Three tanks were removed at this property and this permit was closed on 4/15/2021.

Notice of Violation and Warning Letters. There were no Warning or Notice of Violation letters issued in this drainage basin in 2021.

A.8 OUTFALL 254

A.8.1 OUTFALL 254 DRAINAGE BASIN

The OF254 drainage basin is located on the Tideflats and is the fifth largest basin in the Foss Waterway Watershed (see WY2021 Report, Figure 1-3). It is approximately 119 acres and drains through a 42-inch outfall pipe located at the head of Wheeler-Osgood Waterway on East F Street just north of East 15th Street. The drainage area includes East 15th Street from East D Street to St. Paul Avenue, East J Street from East 15th Street to the 1600 block, and St. Paul Avenue from East 11th Street to Portland Avenue.

The majority of the OF254 drainage basin is zoned for industrial use, but small commercial areas are present near the shoreline.

Because of the low basin elevation, the entire storm system is influenced by saltwater at high tide. Baseflow from OF254 is continuous at approximately 0.4 cfs (see Appendix B, Table B2-2) and originates primarily from tidal backflushing. Sources of baseflow are discussed in more detail in Appendix B.

A.8.2 2002-2021 SOURCE CONTROL ACTIVITIES

Since 2002, significant work has been accomplished in the OF254 drainage basin including intense business inspections, complete line cleaning and identification and removal of point sources. A discussion of specific major source control activities is provided in the following paragraphs.

As part of the City-wide inspection program, nine business inspections were completed in the OF254 drainage basin in 2021. Business inspections provide source control through education and through implementation of nonstructural BMPs. These actions help prevent materials from coming into contact with stormwater and help promote activities that reduce pollutants in stormwater.

Stormwater treatment devices currently in place also remove solids and the associated particulate-bound chemical from stormwater. The locations of private and public stormwater treatment devices in the OF254 drainage basin are shown on Figures A-1a and A-1b, respectively. No new public or private treatment BMPs were installed in this drainage basin in 2021. With future redevelopment in the basin, more onsite treatment systems will be installed and over time they will help to decrease the solids load and the associated particulate chemical load to the waterway.

A summary of pipe cleaning and maintenance projects completed in the OF254 drainage basin during 2021 is provided in Table A.8-1 of Attachment A.8.

Storm System Cleaning. Between January and June 2006, the entire storm sewer system in the OF254 drainage basin was cleaned, including laterals and CBs. Sweeping and installation of onsite treatment systems are expected to reduce the solids load and associated PAHs load to the waterway.

Since the time of the complete cleaning of the OF254 basin, additional cleaning has been performed in the basin in isolated areas. These cleaning and video inspection activities have been done for a variety of reasons, including areas identified as needing maintenance through the STRAP program, complaints, and business inspection follow-ups.

Northern Pacific Rail Yard Oil Pipeline and Standard Oil Site Cleanup. A possible source of PAHs in the OF254 drainage basin may have been associated with the Northern Pacific Rail yard oil pipeline area along East D Street to the old Standard Oil site. In 2009, the Northern Pacific Rail yard oil pipeline area along East D Street and East 19th Street was remediated as directed by Ecology. In 2010, the final phase of this cleanup within the OF254 drainage basin was completed. Ecology provided oversight of this remediation project.

Northwest Detention Center DEHP Investigation. The Northwest Detention Center (NWDC, formerly known as INS), a private immigration-related prison, was constructed at the former Hygrade Meat site. Previous sediment results collected from the City's storm system showed that NWDC was a point source of DEHP. In WY2006 through WY2008, DEHP was found in the inlet pipe to the stormwater pond at concentrations up to 790,000 µg/kg.

In 2009, NWDC was remodeled, and media filtration stormwater treatment devices were installed. In 2010, Tacoma confirmed that the DEHP-laden sediments were retained in the stormwater treatment devices. DEHP was less than 1,500 µg/kg immediately downstream in the City system. However, DEHP-laden sediment remained at levels up to 2.7M ug/kg in one part of the private drainage. Further sampling and source tracing identified one source of the DEHP to be laundry lint that accumulated on the open ground and eventually washed into the private storm drain system. Filters were placed in the catch basins, and Environmental Compliance required the property owner to provide regular maintenance of these devices. In 2012, inspectors returned to the facility for the annual inspection and found the filters to be impacted. The City submitted a corrective action letter and subsequently confirmed compliance during a follow-up inspection. During facility inspections in 2013, it was found that the filters continued to be impacted but the stormfilter system appeared to be effective in keeping the material on site. It was also determined that the lint collection system had not been properly installed. This system has now been repaired. Inspections performed at the site in 2015 indicated that the filters were continuing to be properly maintained and no concerns were noted. Annual inspections will continue, however, at this time it appears that NWDC has a good maintenance plan and is following their O&M requirements.

Outfall 254 Source Tracing. In response to the somewhat elevated levels of TSS and zinc in stormwater in this area, the City conducted a concentrated source control effort in the OF254 drainage basin. This is a highly industrial area and many of the businesses here do not have paved yards with private collection systems, which leads to high amounts of track out onto the public rights of way in the OF254 drainage basin. In January 2020, the City increased street sweeping in a portion of this basin to help limit the amount of sediment entering the municipal stormwater system.

In 2019, the City did an initial visual assessment of the drainage basin, noting which businesses had unpaved driveways and storage yards, as well as which businesses appeared to have the possibility of contributing contaminants to the municipal stormwater system. Inspections were completed at identified businesses, and all passed with no issues noted. This area will continue to be evaluated over time to determine whether increased street sweeping leads to a reduction in TSS and zinc in the stormwater.

Baseflow Quality in WY2007 and WY2008. In two different years for several different chemicals, baseflow quality was above average. In WY2008 (Year 7), TSS and DEHP were detected at higher concentrations in the dry weather events, well above all the other years (see boxplots in Appendix G in the WY2012 Report). In WY2007 (Year 6), lead was detected at higher concentrations in the dry weather events, well above all the other years (see boxplots in Appendix G in the WY2012 Report). The dry weather DEHP and lead concentrations for those years were

at the same levels as the average stormwater concentrations for OF254. In contrast, these TSS baseflow concentrations were well below TSS stormwater concentrations. The source of the dry weather concentrations is unknown. These concentrations were not repeated in the following baseflow monitoring years, WY2009 through WY2011.

Enhanced Street Sweeping. In January 2007, the City's street sweeping program was transferred from the Streets and Grounds division to the Sewer Transmission Maintenance section for continued implementation. The program was enhanced at that time in an attempt to reduce sediment buildup in the storm sewer system. The schedule was set to sweep all areas of the City twice per year, with more frequent sweeping in the business districts and on major arterials. The City also increased communications with residents and business owners, which helped raise awareness of the importance of the street sweeping program.

In 2007, when the work was transferred over, sweeping was done with a combination of mechanical and vacuum sweepers. In 2008, the City started the transition from mechanical sweepers to regenerative air machines. At this point in the program, the City used four regenerative air sweepers. In mid-2018 due to the end of usable life of one of the City's regenerative air sweepers and a staff retirement, Tacoma temporarily reduced its street sweeping program. This resulted in Tacoma reducing the frequency of arterial sweeping to quarterly and residential streets to annually. The City will be purchasing additional equipment and staff to increase back to the higher sweeping frequency. The sweeper was purchased during 2021, however there are currently delivery delays. The expected delivery date is October 2022 – early January 2023. GPS is used to track the number of miles swept and the amount of material removed is recorded.

Street Sweeping Pilot Project. OF243 and OF245 have shown somewhat elevated levels of lead and zinc in both stormwater and baseflow relative to other drains. It is theorized that this may be due to the increased amount of trucking in this industrial area. Based on these results, the City initiated a pilot program in WY2014 to determine whether an increased frequency of street sweeping in this area would have an effect on these results. Starting on October 1, 2013, the City began sweeping the ROW within the OF243 and OF245 drainage basins at a frequency of once every two weeks rather than the usual frequency of once per month for industrial areas. The pilot project continued in WY2021. With several years of data available, statistical analysis of the effectiveness of this enhanced sweeping schedule was done for the first time in WY2017 and is included again in this report. Results will be more statistically robust as additional data becomes available. Results of this analysis are presented in Section 5 of the WY2021 Stormwater Monitoring Report. As discussed above, the pilot project was expanded into a portion of OF254 in January 2019. As staff and equipment capacity becomes available the City hopes to increase street sweeping in the entire drainage basin. It is expected this will occur in 2023.

UST and LUST Removal. TPCHD is currently overseeing the removal of USTs and LUSTs in the drainage basin (see Attachment A.1) including:

- UST at Rainier Plywood located at 624 15th St. E. Contaminated soils and contaminated groundwater are present at the site and monitoring wells are in place. The permit was renewed in October 2021 and remains active at this time.

Notice of Violation and Warning Letters. There was a Notice of Violation with penalties issued in this drainage basin in 2021 to Life Express, LLC at 525 E 15th Street on October 7, 2021. There was an

Illicit discharge of sediment, gravel, and asphalt to receiving waters of the Wheeler Osgood Waterway in violation of TMC 12.08D.110.C which resulted in a civil penalty of \$1,500.