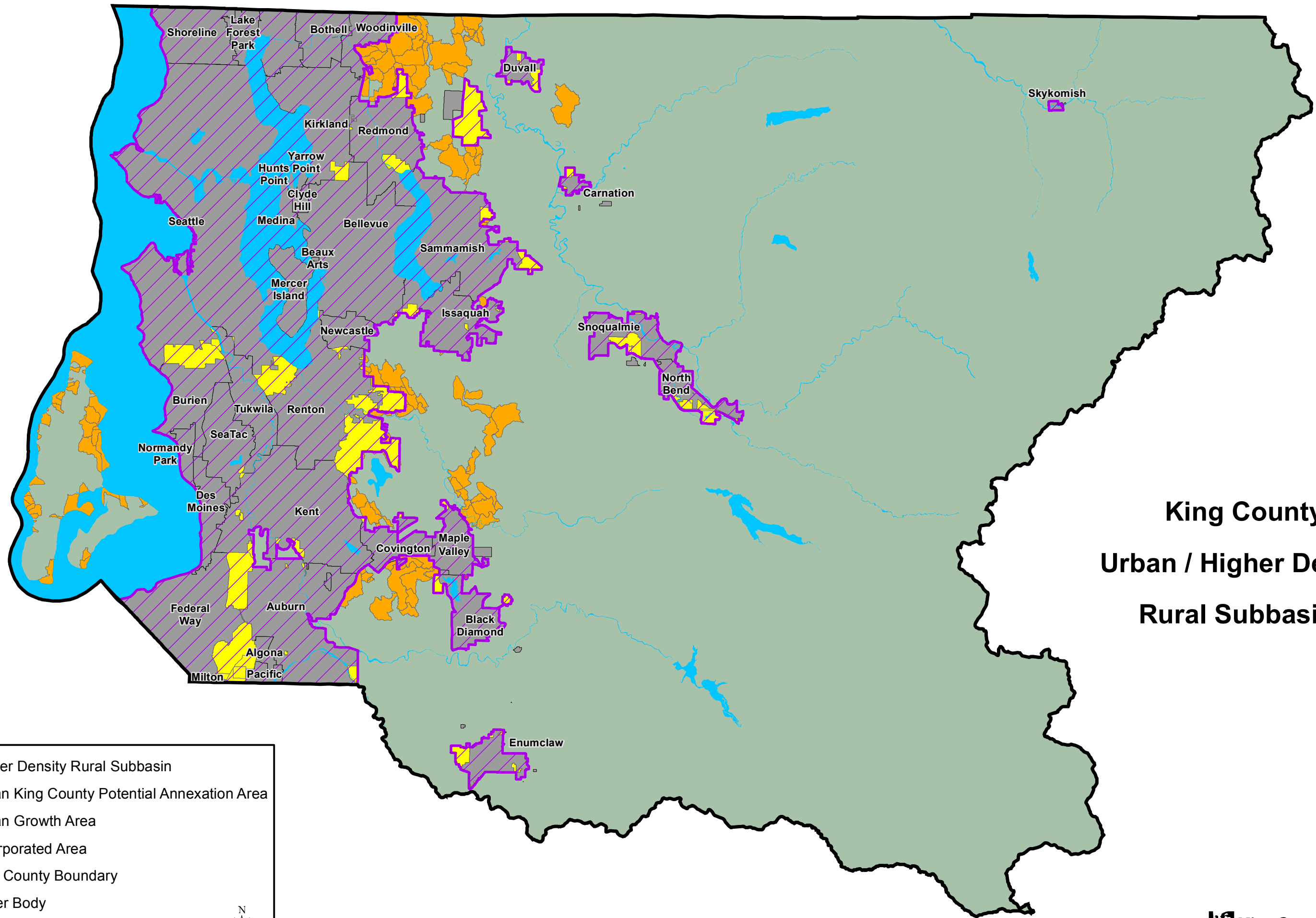


Attachment 2017 Annual Report Question #1:

Attach a notification of any annexations, incorporations or jurisdictional boundary changes resulting in an increase or decrease in the Permittee's geographic area of permit coverage during the reporting period per S9.D.6.



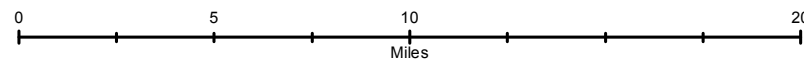
King County

Urban / Higher Density

Rural Subbasins

- Higher Density Rural Subbasin
- Urban King County Potential Annexation Area
- Urban Growth Area
- Incorporated Area
- King County Boundary
- Water Body

The information included on this map has been compiled by King County staff from a variety of sources and is subject to change without notice. King County makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. King County shall not be liable for any general, special, indirect, incidental, or consequential damages including, but not limited to, lost revenues or lost profits resulting from the use or misuse of the information contained on this map. Any sale of this map or information on this map is prohibited except by written permission of King County.



King County
Department of Natural Resources and Parks
Water and Land Resources Division

Attachment 2017 Annual Report Question #71:

For TMDL listed in Appendix 2: Attach a summary of relevant SWMP and Appendix 2 activities to address the applicable TMDL parameter(s), (S7.A).

King County Stormwater Services

Bear-Evans Creek FC TMDL Program 2017

Executive Summary

This document answers Question 71 of the questionnaire from the Washington State Department of Ecology regarding King County's Phase I NPDES Municipal Stormwater Permit implementation activities for 2017.

In 2017, King County Stormwater Services (SWS) staff conducted bacterial source screening in the County's municipal separate storm sewer (MS4) in the Bear and Evans Creek basins, as required by the 2013-2018 municipal NPDES permit. Work and findings specific to year 2017 are summarized in this document.

The following is a brief list of highlights from SWS' work in 2017; details of each are included later in this document:

- One major anthropogenic source of fecal bacteria to the County's MS4 and Bear Creek, discovered by SWS in mid-2015, was eliminated;
- Follow-up investigation continued at a second location, where it is suspected that a failing on-site septic system (OSS) is sending fecal waste to the MS4;
- SWS's response to a water-quality complaint in the Evans Creek basin led to the identification and elimination of a sewage discharge from a sanitary sewer line; and
- SWS continued to perform dry-season screening of its MS4, as well as wet-season sampling of select MS4 sites.

In 2018, King County SWSS will continue both dry-season and wet-season sampling and reconnaissance work in its MS4 in these stream basins.

Regulatory Requirements:

Under the Washington State Department of Ecology Phase I NPDES Municipal Stormwater Permit effective August 1, 2013, in Appendix 2, Bear/Evans Fecal Coliform TMDL, King County is required to perform the following:

- "Designate areas discharging via the MS4 to the TMDL area as high priority areas for illicit discharge detection and elimination. Complete IDDE field screening for bacteria sources in 50 percent of MS4 subbasins, including rural MS4 subbasins, by February 2, 2017 and implement the schedules and activities identified in S5.C.8 of the Phase I permit for response to any illicit discharges found."
- "Install and maintain animal waste education and/or collection stations at municipal parks and other Permittee owned and operated lands reasonably expected to have substantial animal (dog and horse) use and the potential for pollution of stormwater."

Previous reports

The Annual Reports for years 2015 and 2016 may be consulted for descriptions of work previously conducted for the Bear/Evans Fecal Coliform TMDL. Copies of this report can be provided upon request. These reports included SWS' Sampling and Analysis Plan (SAP) for wet-season sampling work in the Bear/Evans Creek basin. The work discussed in this report has adhered to the approach described in the updated version of the SAP provided with the 2016 Annual Report.

Work conducted in the Bear/Evans Creek basin, year 2017

In 2017, the following work was performed in the Bear/Evans Creek basin:

- Follow-up on known and suspected sources of fecal bacteria to Bear and Evans Creeks
- Dry-season reconnaissance and sampling
- Wet-season reconnaissance, sampling and source tracking
- Mapping of the County's MS4 in the Bear and Evans Creek basins
- Acquisition of additional animal biomarker data for samples collected in late 2015 and 2016
- Animal waste collection stations and waste pick-up reminder signs
- Public outreach
- Business inspection program

Follow-up on known and suspected sources of fecal bacteria. A major illicit discharge of wastewater to the County's MS4 was detected by SWS in 2015. High bacteria levels were noted during storms in a King County stormwater outfall to Bear Creek. Source tracking was initiated, and a creek-side property (in the City of Redmond) with a failing OSS was identified. The problem was referred to the City of Redmond and the Department of Public Health-Seattle & King County Public Health (DPHSC), who mandated that the property owner connect all wastewater fixtures to the City of Redmond's sanitary sewer system. The connection was completed in June 2017. Follow-up sampling to confirm that no sewage is leaving the property (via the MS4) will take place in early 2018.

Another illicit discharge was detected by SWS in the Cottage Lake Creek basin in unincorporated King County in summer 2016, and confirmed as OSS-related sewage (using qPCR analysis) in late 2016. Dye testing carried out by DPHSC at a suspect property was delayed due to a property owner being out of the country for many months; however, dye testing in late 2017 found no evidence that the suspect property was responsible for the illicit flows. Other potentially responsible properties are now being investigated by DPHSC.

In May 2017, SWS received a complaint from a Washington State Department of Transportation utility crew about a suspect discharge along State Route 202 in the Evans Creek basin. SWS personnel determined it was human sewage, and also determined that the problem was due to leaking infrastructure belonging to the NE Sammamish Sewer and Water District (NESSWD). SWS referred the problem to NESSWD, and the problem was immediately fixed and cleaned up.

Other suspected sources of fecal bacteria in the Bear and Evans basins are still being investigated, and will be described in future annual reports as appropriate.

Dry-season work. During the dry season of 2017, SWS visited and screened for bacteria sources at 337 locations in the Bear/Evans basin where stormwater leaves the County's MS4. SWS has now visited 840 of the total 933 locations in these basins where stormwater leaves the County's MS4. (As referred to below, many of the unvisited locations have been mapped only recently.) *E. coli* measurements have been made at all locations (about 120 of the 840 just mentioned) where flowing water was found in the dry season. At most of these locations, pH, temperature, specific conductivity and ammonium were also measured. These measurements have also been made at some locations without flowing water, where poor pool quality in a nearby catch basin gave reason for concern. At almost all sites, measurements suggest that dry-season flows are groundwater (very low in *E. coli*, ammonium and temperature with roughly neutral pH and conductivity characteristic of the basin). Follow-up is performed at any sites where readings exceed trigger levels. One illicit discharge, not mentioned above, was identified during dry-season reconnaissance in 2017: at the Trilogy residential subdivision on Redmond Ridge, it was discovered that the subdivision's contracted landscaping company was dumping grass clippings into the County's MS4. Measurements suggested that this may have been a significant source of fecal indicator bacteria (FIB) to the MS4. SWS worked with the homeowner's association to end this practice.

Dry-season inspection observations and collected analytical data are stored in SWS' stormwater geodatabase. For a map of locations where dry-season inspections were conducted in 2017, please see Figure 1 at the end of this document. In 2018, SWS will continue with this work, initiating source tracking wherever high *E. coli* levels are found in dry-season flow in the MS4.

Wet-season work. In late 2015, SWS initiated storm sampling in its MS4 to attempt to identify possible sources of excessive levels of fecal bacteria. Although wet-season bacteria screening in the Bear/Evans basin is not required by the County's NPDES permit, SWS believes that certain problems cannot be detected in the dry season that may be detected in wet weather. Furthermore, analysis of creek-water samples indicates that fecal coliform levels in the creeks spike significantly during storms. To the extent that FIB might be transported to the creeks via the County's MS4, it was considered worthwhile to sample in the MS4 during storms. This work continued throughout 2017 in numerous events, and is planned to continue in 2018. Storm sampling sites are currently concentrated in portions of the Bear/Evans basin suspected to have relatively high fecal bacteria inputs, based on stream sampling data acquired during storms. While no bacteria sources were specifically identified in year 2017 by means of storm sampling, analytical results at several locations gave reason for further investigation. As of time of writing, storm samples from about 130 locations in the County's MS4 have been analyzed for FIB; many of these locations have been visited multiple times. Wet-season inspection observations and collected analytical data are stored in SWS' stormwater geodatabase. For a map of the locations where fecal bacteria measurements were made in 2017, please see Figure 2 at the end of this document.

Mapping of the County's MS4. King County's MS4 in the Bear and Evans basins consists of over 250 miles of conveyance and roughly 7000 catch basins or manholes. At the beginning of this TMDL program, mapping data in many locations in these basins were either outdated or incomplete. In 2017, SWS finished its mapping of major portions of the Bear and Evans basins, with a focus on urban subbasins, high-density rural subbasins and subbasins prioritized for TMDL work. This effort has turned up hundreds of locations where water leaves the County's MS4 that were not previously mapped. Improvement of the County's mapping data, though not explicitly mentioned in previous annual reports, is a major aspect of the TMDL program described here.

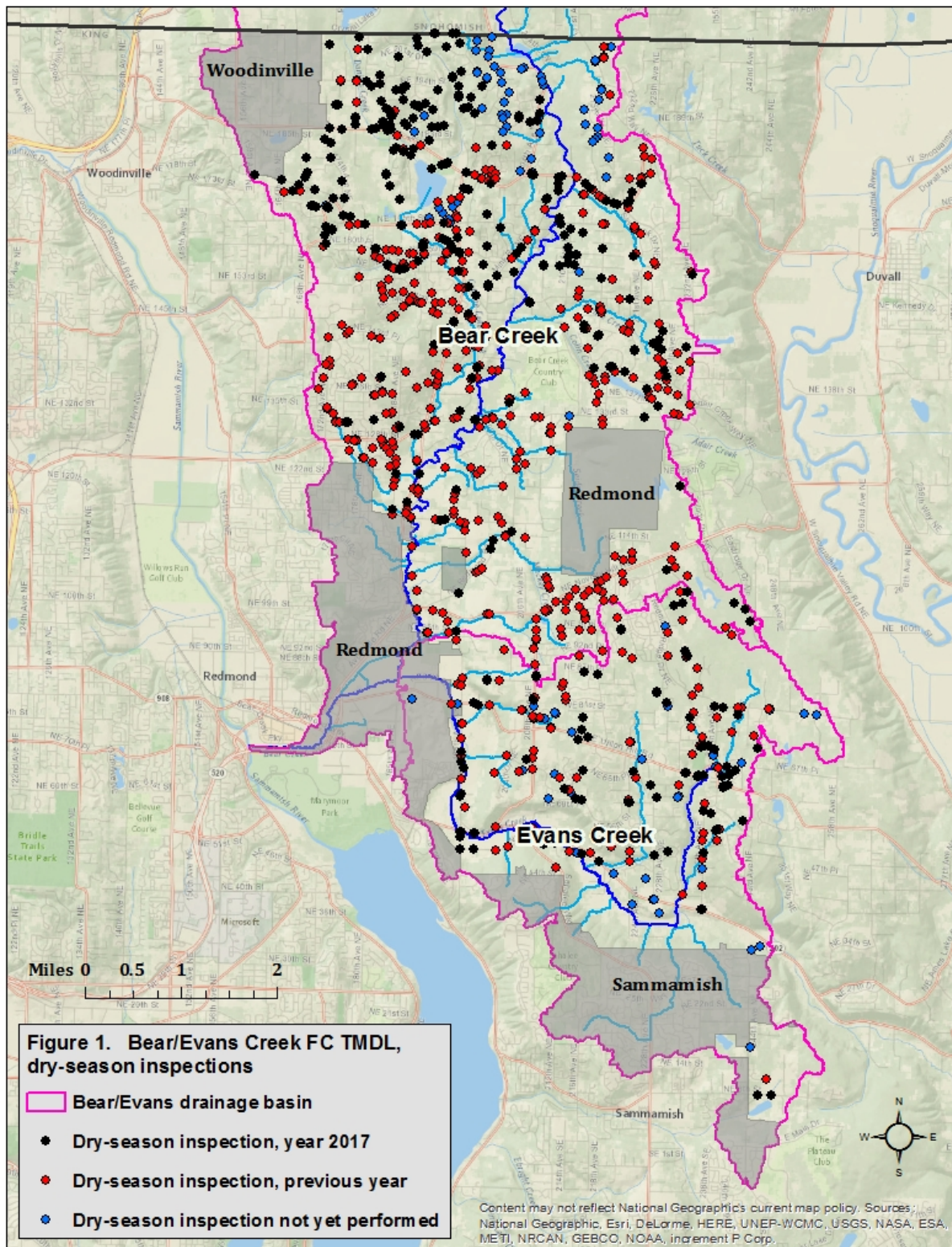
Acquisition of qPCR data. As described in the SAP, samples were initially analyzed for only *E. coli* and, using quantitative polymerase chain reaction (qPCR) DNA amplification techniques, the human-specific biomarker *Hu-2-Bacteroidales*. Sample extract was also frozen and stored for possible additional future qPCR analyses. This approach was used because of the high expense of qPCR analysis, and the fact that the King County Environmental Laboratory (KCEL) could only analyze for human, ruminant and cow biomarkers. At some locations, repeated, high *E.coli* observations were not accompanied by significant levels of *Hu-2-Bacteroidales*. Therefore, as budget allowed and as appropriate, select samples were submitted in 2017 for additional qPCR analyses – mostly ruminant or horse. Analysis for the horse biomarker was performed by a private laboratory in Florida (Source Molecular). It was determined by submission of blinded samples of horse fecal matter, prepared by KCEL, that Source Molecular’s horse marker consistently provides false negatives. This was disappointing, considering that horses are the major domestic animal on the landscape in the Bear and Evans basins, and because there is reason to believe that horse waste can contribute significant amounts of FIB to stormwater runoff. SWS and KCEL are looking for another way of analyzing water samples for horse fecal waste, but so far to no avail.

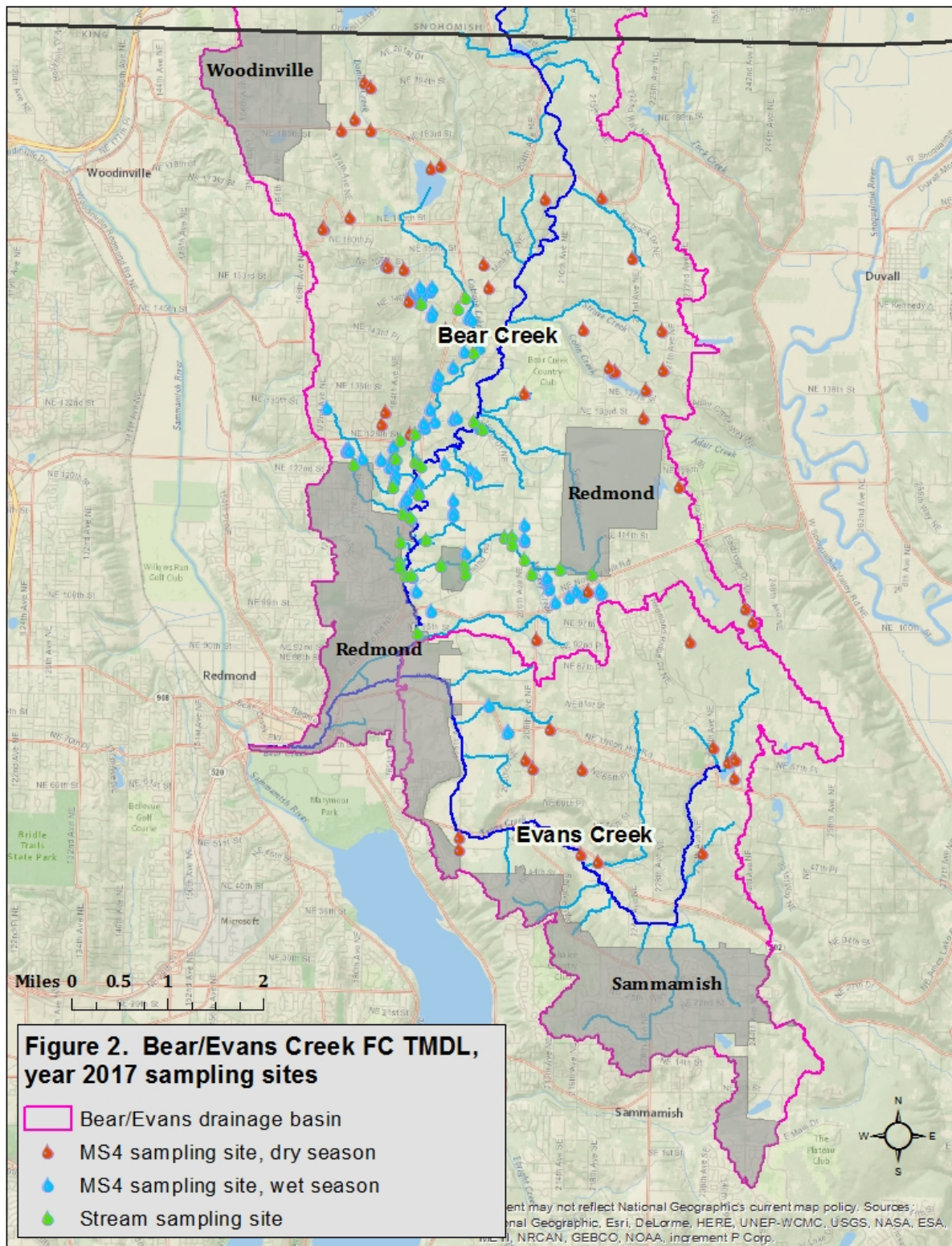
Pet waste stations/signs. As reported in previous Annual Reports, a total of three County-owned properties were found to potentially benefit from the installation of pet waste collection stations. A total of two County-owned properties were found to potentially benefit from the installation of pet waste pick-up reminder signs. These five properties are owned and maintained by the King County Parks Department (‘Parks’). In June 2017, Parks notified SWS that these recommended pet waste stations and signs have all been installed, fulfilling this Permit requirement.

Public outreach. The FC TMDL program manager attended the annual summer meeting of the Sno-King Watershed Council in August 2017. The purpose of attending this meeting was to continue King County’s relationship with this community group, meet with local residents, learn about various efforts this group participates in, and provide information specific to King County’s Bear/Evans FC TMDL efforts.

Business inspections. SWS’ existing business inspection program was leveraged to support this TMDL work. A total of 20 business properties in the Bear and Evans basins were identified as needing their once-per-five-year inspections in 2017. Of the 20 properties visited by staff, none were identified as having business practices that were contributing to the fecal bacteria problem in the creeks. One business -- a large grocery store -- was identified in mid-2016 as needing to replace a leaking dumpster and a leaking compactor. The dumpster and compactor were finally replaced in April 2017.

----end of write-up. Figures on following pages---





King County Science & Stormwater Services Sections

Issaquah Creek FC TMDL Program 2017

Introduction

The Issaquah Creek basin is located in the Cedar/Sammamish basin in Water Resources Inventory Area 8 (WRIA 8) in western Washington State. The middle and upper Issaquah Creek subbasins are considered Regionally Significant Resource Areas because of their exceptional fisheries habitat and forested land cover. However, there are several factors contributing to the decline of fish habitat within the basin, including the exceedance of nutrient loadings and State water quality standards during storm events.

Segments of Issaquah Creek and its tributaries regularly exceeded State fecal coliform standards and in 2004 the Washington State Department of Ecology implemented a Total Maximum Daily Load (TMDL) plan to reduce fecal coliform concentrations in impaired segments and maintain the health of unimpaired reaches. The plan identified likely sources of contamination to include fecal material from failing septic systems, domestic animals, and wildlife, with transport mechanisms including urban and rural stormwater conveyance systems.

Under Appendix 2 of the 2013 – 2018 Phase I National Pollution Discharge Elimination System (NPDES) Municipal Stormwater Permit, the jurisdiction of King County is required to perform certain tasks to attempt to reduce bacterial loadings to Issaquah Creek and its tributaries. One requirement is to perform bacteria source screening in at least 50 percent of the Issaquah Creek municipal separate storm sewer system (MS4) subbasins. A second requirement is for the County to inventory its properties to ascertain if any can benefit from installing pet waste collection stations or waste pick-up reminder signs. The following document describes King County's efforts in 2017 to fulfill these requirements.

Task Description Narrative

Updates on the major task descriptions in 2017 (see Figure 1 in Appendix A):

Mapping: Updates and corrections to the King County ArcGIS MS4 map occurred throughout 2017. Work focused on verifying MS4 outfalls, delineating Issaquah basin and subbasin boundaries, and documenting natural drainage through the MS4 system.

Selection of Subbasins: No updates; subbasins selected in 2016. Herein referred to as “targeted subbasin”.

Field recon: Enhanced Conveyance Screening Program (CSP) inspections occurred throughout summer of 2017. When flowing water was observed, King County staff obtained field parameters and *E. coli* concentrations.

Establish sampling sites: Sampling sites were established in 2016.

Sampling & analysis plan (SAP) development: No updates; draft of the SAP was completed in November of 2016.

View the SAP here: <http://your.kingcounty.gov/dnrp/library/2016/kcr2823/kcr2823-rpt.pdf>

SAP implementation: SAP implementation began on November 15, 2016. SAP implementation occurred in 2017 and will continue in 2018.

Animal waste collection stations and waste pick-up reminder signs: Inventorying of and field visits to County-owned and operated properties began in late 2016 and was completed in January 2017. One pet waste collection station was recommended to be installed at the west entrance to the Taylor Mountain Forest park trail system, which is owned and maintained by King County Parks Department (Parks). Two properties were found to potentially benefit from the installation of pet waste pick-up reminder signs. One location is the south boundary gate of the Taylor Mountain Forest park trail. The second property is a stormwater facility owned by King County Water and Land Division (WLRD) but happens to be located within the City of Sammamish. In January 2017, SWS requested that Parks install all three of these. Parks confirmed that this would be done.

Field Reconnaissance, Sampling and Analysis Findings

Enhanced CSP in summer 2017

From June 2, 2017 to September 6, 2017 King County inspected the MS4 at locations where water exits the system (herein referred to as “links”) as part of its Conveyance Screening Program (CSP). When flowing water was observed, King County staff performed “enhanced” CSP inspections which entailed the collection of field parameters (water temperature, specific conductivity, pH, ammonium (NH_4^+), and nitrate (NO_3^-) using a Hydrolab MiniSonde 5¹ and *Escherichia coli* (*E. coli*) concentrations using Coliscan© Easygel© (EZgel) media².

One hundred and forty-eight enhanced CSP inspections were completed in the targeted subbasins of Issaquah Creek (see Figure 2 in Appendix A for a map of all enhanced CSP inspection locations). All links within the high density rural subbasins were inspected as required by the permit. Of the 148 inspections, flowing water was observed on 27 instances (see Table 1 in the Appendix for a table of results).

E. coli concentrations at enhanced CSP locations were generally low. Only three samples exceeded 100 colony forming units per 100 milliliters (CFU/100mL) and of these three samples, only one was >300 CFU/100mL. This would suggest that water flowing through the King County MS4 during the dry season is from groundwater seeps and springs.

The sample collected at locator “Issaquah_88483” (see site highlighted by red circle in Figure 2 in Appendix A) on July 18, 2017 had an *E. coli* concentration of 1,400 CFU/100mL. Issaquah_88483 is a perennial stream that crosses through a King County culvert at Issaquah-Hobart Rd. The unnamed

¹ <https://www.campbellsci.ca/ms5>

² From Micrology Laboratories. <https://www.micrologylabs.com/page/93/Coliscan-Easygel>

stream drains a high density rural area in the Mirrormont area. Follow-up sampling on August 1, 2017 and October 25, 2017 had *E. coli* concentrations of 100 and 42 CFU/100mL, respectively. The high *E. coli* concentration observed in the July 18 sample may have resulted from some one-time or intermittent fecal contamination event. It is also possible that the 1,400 CFU/100mL was obtained erroneously either through contamination or misidentification of colonies during culture counting. This subbasin will be a focus of upcoming work in 2018.

Storm Sampling on June 15, 2017

On June 15, 2017, King County staff collected EZgel samples from 11 locations in the Hobart area of the Issaquah basin. Hobart is located on a plateau between Carey Creek and the Cedar River where land use is predominately rural residential and small agriculture. Sample collection occurred during a summer rainstorm; 1.21" of rainfall fell on June 15, 2017 with 0.40" occurring during the two hour sample collection window.

E. coli concentrations fell into a bimodal distribution where five samples were below 600 CFU/100mL and six exceeded 1,500 CFU/100mL (see Figure 3 and Table 2 in Appendix A). Higher concentration samples generally occurred immediately downstream of agricultural areas, particularly along SE 200th St (some lower concentration samples were collected downstream of agricultural parcels, too). Based on analysis of the 2015 aerial photo, there are grazing fields where animals have unrestricted access to natural drainages that may be contributing to the fecal contamination, especially during rain events. While qPCR analysis was not conducted during this sample event, this area will be the focus of future investigation during 2018.

Source Tracking on Winter Property

King County received a water quality complaint on October 19, 2017 from Kevin Winter, a homeowner in the Mirrormont area on Issaquah Hobart Rd. Site visits were made by King County staff on October 20, 2017 and November 15, 2017. There was a small pool of standing water on the western edge of the Winter Property. The water had a gray/whitish color and had a strong sewage odor (see Figure 4 in Appendix A). There was no discernable surface flow into or out of the pool though topography would likely route the water to a King County stormwater pond which discharges to an unnamed tributary of Issaquah Creek (see Figure 5 in Appendix A).

On November 15th water quality samples were collected at the seep and from a King County MS4 conveyance line up-gradient of the seep (see Figure 5 and Table 3 in Appendix A). Samples were analyzed for *E. coli* and a genetic-based quantitative polymerase chain reaction (qPCR) laboratory technique for identifying the presence of human gut bacteria (Hu-2-and Hu-3). Results confirmed fecal contamination at the seep as *E. coli* concentrations exceeded 1,000,000 CFU/100mL and both qPCR tests exceeded 20,000 copies/mL. Results from the stormwater line did not indicate fecal contamination.

On December 5, 2017, water quality samples were collected from downstream locations to access where water from the contaminated seep may be moving and its impacts to receiving waters

downstream (see Figure 5 and Table 3 in Appendix A). All samples had *E. coli* concentrations below 100 CFU/100mL and none had detectable Hu-2 or Hu-3.

The source of contamination is unclear; the Winters' septic system is located in their front yard and downgradient from the seep and the nearest up-gradient septic fields are over 300 feet away. Neither the Winters nor King County staff identified any other seeps in the area. It is possible that the contaminated water is being conveyed from its source to the seep through a natural or manmade preferential flow path. The case was referred to Seattle King County Public Health (SKCPH) and the investigation is ongoing.

Upcoming Work in 2018

Work in 2018 will focus in three key areas:

1. Dry/Storm sampling in East Mirrormont Subbasin

On July 18, 2017 an enhanced CSP inspection at the mouth of an unnamed tributary (Issaquah_88483) in the East Mirrormont area resulted in an *E. coli* concentration of 1,400 CFU/100mL. Subsequent samples had lower *E. coli* concentrations (≤ 100 CFU/100mL) but such discrepancies may be explained by intermittent fecal contamination or different hydrologic conditions.

The East Mirrormont subbasin is an almost entirely high density rural subbasin. The upper reaches of the watershed are mostly forested above and east of Tiger Mountain Rd. SE where predominately rural residential land uses begin. There are 24 King County MS4 outfalls in the subbasin. The land use gradient from forested to rural residential, along with a relatively small drainage area, allows for an opportunity to conduct a case study on the degree to which King County MS4 outfalls possibly contribute to fecal contamination in small receiving streams during wet and dry conditions. Such a case study is planned to be conducted, if feasible, along with regular SAP implementation in 2018; the case study intends to assess different developed and undeveloped land use covers in relation to MS4 fecal bacteria levels across this subbasin.

2. Dry/Storm sampling on Hobart Plateau Subbasin

Sampling from June 15, 2017 revealed multiple locations in the King County MS4 on the Hobart Plateau where *E. coli* concentrations exceeded 1,000 CFU/100mL. No qPCR analyses were run on these samples, so the source of fecal that fecal confirmation is unknown. Follow-up sampling with qPCR analysis for human and bovine genetic markers during baseflow and stormflow conditions will occur in 2018.

3. Summer Enhanced CSP inspections

Dry weather recon and enhanced CSP inspections will resume in summer of 2018 during baseflow conditions. Sites with flowing water present will be noted and sampled using Coliscan EZgels.

APPENDIX A: TABLES AND FIGURES

Scope of Work, Issaquah Creek FC TMDL 2016-2018, Science & Stormwater Services

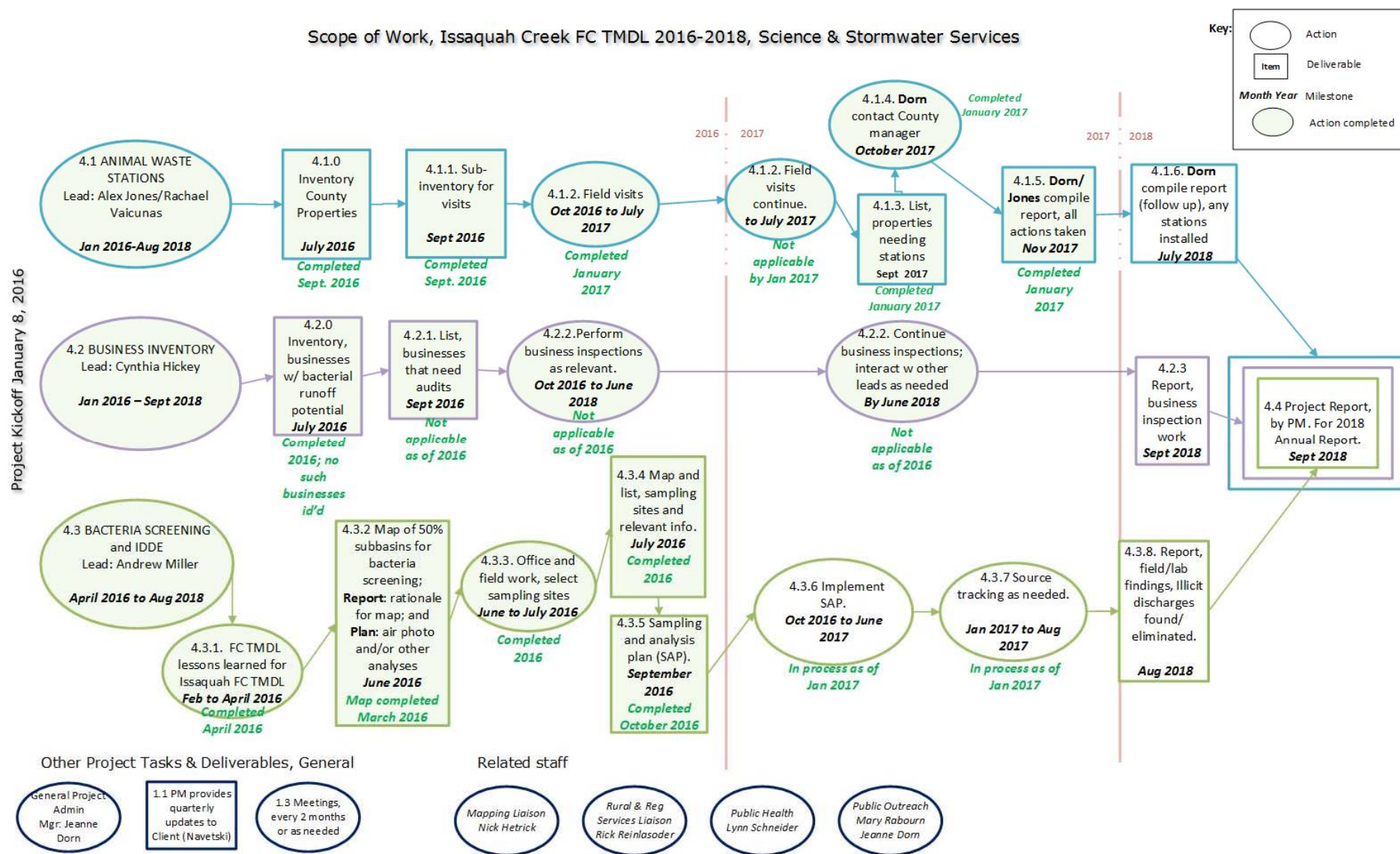


Figure 1 | Project scope of work and timeline.

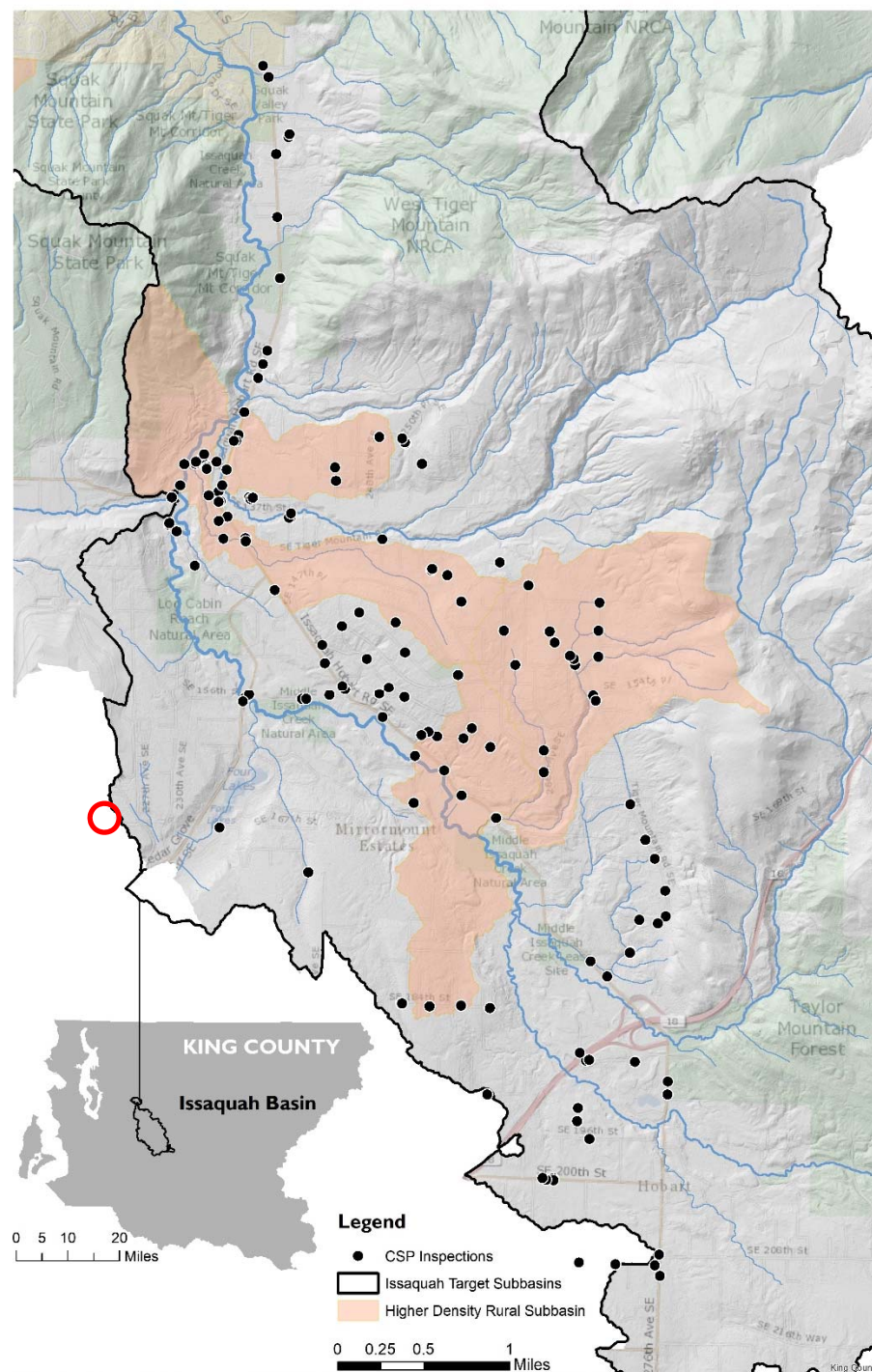


Figure 2 | Map of enhanced CSP inspections of King County stormwater system in the Issaquah Creek basin during summer of 2017. Conventional field parameters and *E. coli* concentrations were measured anywhere flowing water was observed. The site highlighted with the red circle (Issaquah_88483) had an *E. coli* concentration of 1,400 CFU/100mL on July 18, 2017.

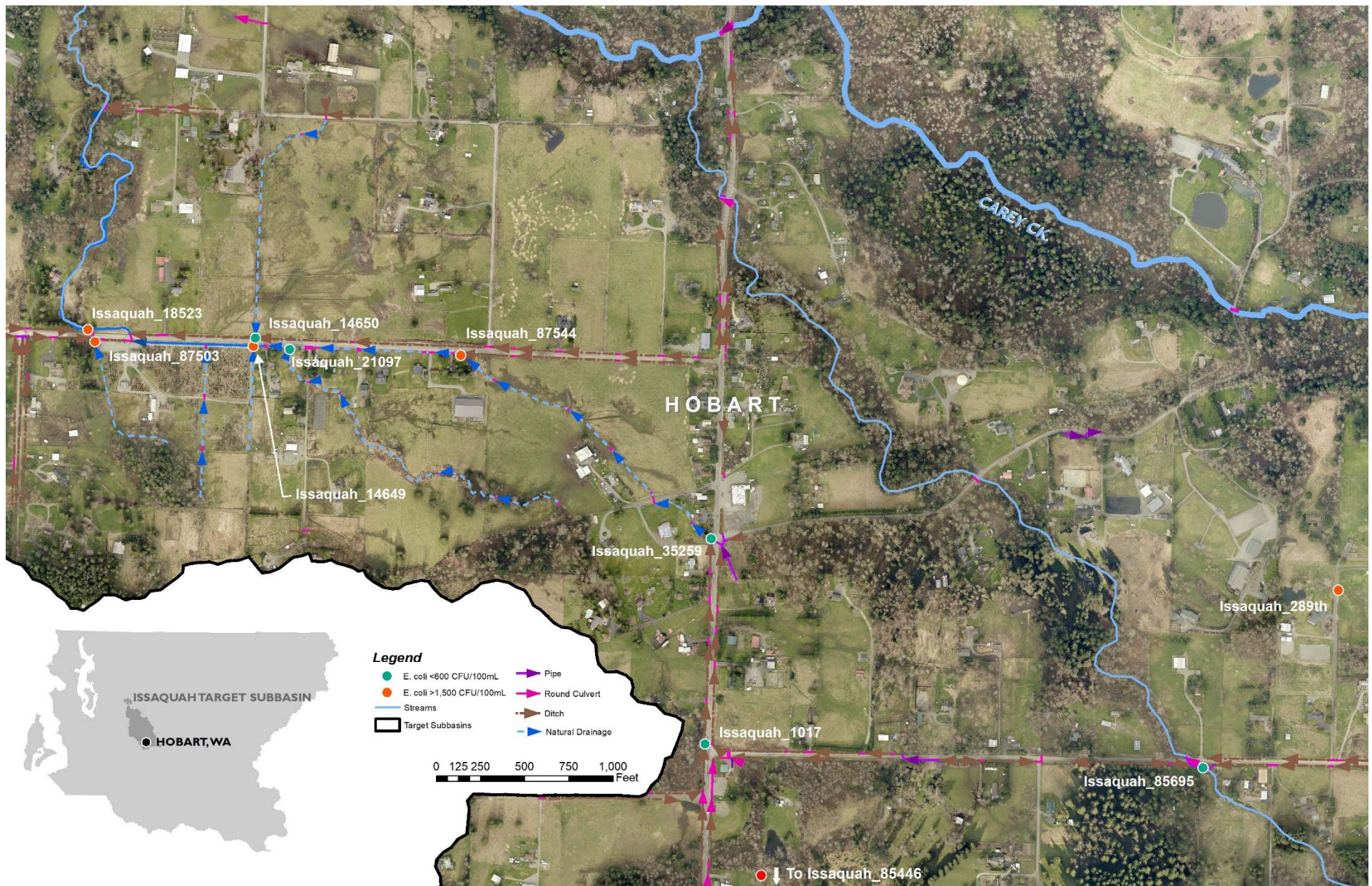


Figure 3 | Map of the Hobart Plateau with June 15, 2017 water quality sampling sites highlighted.

King County

Science & Stormwater Sections

January 11, 2018



Figure 4 | Photo of the seep observed on the Winters' property. The location of this photo is denoted by the red star labelled "Issaquah_15316_SEEP" on Figure 5.

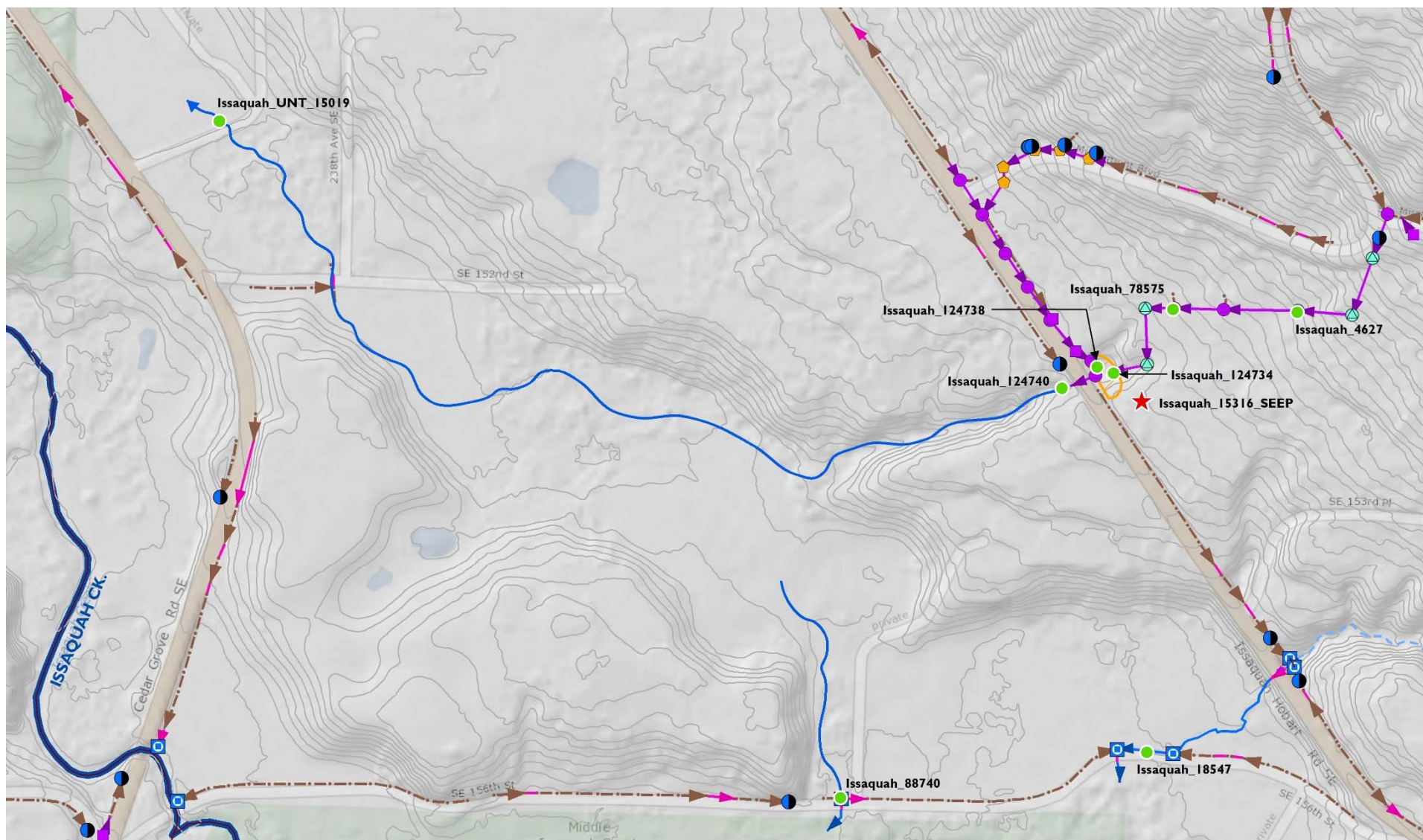


Figure 5 | Map of water quality sampling sites surrounding the Winter property. The contaminated seep (Issaquah_15316_SEEP) is highlighted with a red star. The King County stormwater network is shown in brown and purple lines. Intermittent and perennial streams are shown with blue lines.

Table 1 | Table of water quality samples collected as part of enhanced CSP screening of the King County stormwater system during summer of 2017. Field parameters and *E. coli* concentration (via Ezgel) were collected anywhere flowing water was observed.

Locator	Date	Time (local)	Sp. Conductivity	pH	NH4	NO3	Temperature	Flow Estimate*	<i>E. coli</i> (Ezgel)	Notes
			µs/cm		mg/L	mg/L	°C	as noted	CFU/100mL	
Issaquah_1927	6/27/2017	15:00							0	
Issaquah_UNT_SVP	7/13/2017	10:36	59.00	7.07	0.07	0.72	12.03	0.75 cfs	110	saw fish in channel
Issaquah_21273	7/13/2017	10:40	130.30	7.06	0.07	0.41	14.20	1-2 gpm	30	
Issaquah_87988	7/13/2017	11:08	81.30	7.13	0.02	1.30	14.87	5-10 gpm	20	
Issaquah_4622	7/13/2017	13:50	135.20	7.71	0.03	2.08	12.53		0	
Issaquah_4621	7/13/2017	14:15	120.00	7.65	0.05	0.63	14.89	5 gpm	70	
Issaquah_35814	7/13/2017	14:35	146.00	7.80	0.05	0.55	15.77	3-5 gpm	0	
Issaquah_35770	7/13/2017	14:55	194.50	8.29	0.05	3.61	14.68	0.1 cfs	0	lots of algae in channel
Issaquah_18547	7/18/2017	10:30	174.30	8.32**	0.09	9.49**	12.53	0.3 cfs	10	
Issaquah_88523	7/18/2017	11:35	130.30	8.49**	0.06	10.53**	12.48	1-1.5 cfs	90	
Issaquah_88483	7/18/2017	11:54	130.10	8.35	0.14	2.44	13.72		1,400	Natural drainage, 2 roadsie outfalls dry
Issaquah_4646	7/18/2017	13:35	165.30	8.49	0.24	4.43	13.50	0.05-0.10 cfs	10	
Issaquah_35416	7/18/2017	13:57							0	water pulsing out of pipe. Sampled out of pool below.
Issaquah_88338	7/18/2017	14:15							0	
Issaquah_88694	7/18/2017	14:35							290	used sampling pole and cup
Issaquah_4637	8/1/2017	10:30	127.4	7.46	0.05	0.15	17.31	1-2 gpm	10	
Issaquah_88674	8/1/2017	11:05	173.2	7.96	0.05	0.78	19.73	less than 1 gpm	20	
Issaquah_88629	8/1/2017	13:25	138.1	7.92	0.04	1.21	15.56	0.04 cfs	90	new site; saw fish, caddis
Issaquah_88483	8/1/2017	13:15						0.04 cfs	100	saw 5-7 juvenile salmonids, caddisfly larvae
Issaquah_18547	8/1/2017	13:56	185.8	7.76	0.05	1.62	15.03	0.1 cfs		
Issaquah_UNT_231pl	8/1/2017	14:45	172.5	7.64	0.07	1.17	14.82	2-3 cfs	30	new site; saw caddisfly larvae
Issaquah_35476	8/8/2017	12:18	73.4	7.67	0.07	0.26	17.87	<1 gpm	0	
Issaquah_87808	8/15/2017	11:10	118.7	7.62	0.15	0.35	13.44	0.8 cfs	10	new site
Issaquah_20206	8/15/2017	12:30	115.5	7.5	0.12	0.47	13.08	0.6 cfs	10	new site; pH still slowly dropping at reading
Issaquah_Mac_Ck	8/15/2017	12:50	121.3	7.64	0.1	1.02	12.92	3 cfs		new site; mouth of Macdonald Ck. Not in target subbasins
Issaquah_35585	8/15/2017	13:03	117.4	7.43	0.08	0.58	14.4	2 gpm	0	
Issaquah_20332	8/15/2017	14:06	201.9	8.48	0.05	2.7	17.63	0.1 cfs	30	channel choked w/ green algae

* gpm = gallons per minutes; cfs = cubic feet per second

** values higher than expected

Table 2 | Table showing water quality samples collected on June 15, 2017. Samples were collected from forested and agricultural areas on the Hobart Plateau. Approximately 0.40" inches of rain fell during the sampling period from 14:00 – 16:00 PST.

Locator	Date	<i>E. coli</i> (EZgel)
		CFU/100mL
Issaquah_85446	6/15/2017 13:56	1,720
Issaquah_1017	6/15/2017 14:15	440
Issaquah_85695	6/15/2017 14:23	570
Issaquah_289th	6/15/2017 14:31	3,920
Issaquah_35259	6/15/2017 14:48	70
Issaquah_87544	6/15/2017 15:03	3,440
Issaquah_21097	6/15/2017 15:12	290
Issaquah_14650	6/15/2017 15:20	290
Issaquah_14649	6/15/2017 15:31	5,680
Issaquah_87503	6/15/2017 15:43	3,840
Issaquah_18523	6/15/2017 15:50	2,640

Table 3 | Table of water quality samples collected as part of the investigation into the drainage complaint on the Winter property.

Locator	Date	<i>E. coli</i> (Ezgel)	<i>E. coli</i> (KC Lab)	Hu-2 (KC Lab)	Hu-3 (KC Lab)
		CFU/100mL	CFU/100mL	copies/mL	copies/mL
ISSAQUAH_15316_SEEP	11/15/2017 10:55	93,600	1,500,000	20,000	41,000
ISSAQUAH_124734	11/15/2017 11:11	40	64	1.8	<MDL
ISSAQUAH_78575	11/15/2017 11:30	10	27	1.7	<MDL
ISSAQUAH_18547	12/5/2017 10:23	--	13	<MDL	<MDL
ISSAQUAH_88740	12/5/2017 10:28	--	13	<MDL	<MDL
ISSAQUAH_UNT_15019	12/5/2017 10:37	--	23	<MDL	<MDL
ISSAQUAH_124734	12/5/2017 11:50	--	10	<MDL	<MDL
ISSAQUAH_124738	12/5/2017 11:55	--	5	<MDL	<MDL
ISSAQUAH_124740	12/5/2017 12:00	--	5	<MDL	<MDL
ISSAQUAH_4627	12/5/2017 12:45	--	26	<MDL	<MDL

King County Stormwater Services

Puyallup-White River FC TMDL Program 2017

Executive Summary

This document responds to Question 71 of the questionnaire from the Washington State Department of Ecology (Ecology) regarding King County's 2013-2018 Phase I NPDES Municipal Stormwater Permit, specifically the Appendix 2 Puyallup-White Fecal Coliform Total Maximum Daily Load (FC TMDL) implementation activities for 2017.

In 2017, King County Stormwater Services (SWS) staff conducted bacterial source screening in both the Boise and Jovita Creek municipal separate storm sewer (MS4) basins as required by its municipal NPDES permit. Work and findings specific to each basin in 2017 are described in this document. For work performed prior to 2017, previous documentation submitted to Ecology for years 2014, 2015 and 2016 can be reviewed. Copies of these previous reports can be provided upon request.

The following is a brief list of highlights from SWS' work in 2017; details of each are included later in this document:

- One illicitly connected on-site septic system (OSS), which was discovered by SWS in late 2014 to be plumbed to the County's MS4, was replaced, thanks to enforcement by the Department of Public Health-Seattle & King County (DPHSC).
- SWS discovered, after months of source tracking, another property directly plumbed to the County's MS4; enforcement was initiated by DPHSC.
- SWS discontinued its analysis of samples for the animal biomarkers Rum-2-Bacteroidales, CowM2 and CowM3 (qPCR assays), and prepared a document for Ecology listing some properties that appear to be sources of domestic animal fecal bacteria.
- Monthly *E. coli* monitoring at a dozen sites in Boise Creek and its tributaries was initiated in May 2017.

Regulatory Requirements

Under Ecology's Phase I NPDES Municipal Stormwater Permit effective August 1, 2013, in Appendix 2, Puyallup Watershed Fecal Coliform TMDL, King County is required to perform the following:

- Designate areas discharging via the MS4 to Boise Creek as high priority areas for illicit discharge detection and elimination. Complete IDDE field screening for bacteria sources in 100 percent of the MS4 subbasins, including rural subbasins, by February 2, 2016 and implement the schedules and activities identified in S5.C.8 of the Phase I permit for

response to any illicit discharges found. Field screening must include activities for both the dry season (May through September) and the wet season (October through April).

- Inventory commercial animal handling areas (associated with Standard Industrial Code 074 and 075) in areas discharging via the MS4 to Boise Creek and conduct inspections of these areas as part of the Source Control program required in S5.C.7 of the Phase I permit. All qualifying facilities must be inspected by August 1, 2016. The Permitted shall implement an ongoing inspection program to re-inspect facilities or areas with bacteria source control problems every three years. (County note: no such areas were found in the Boise Creek basin.)
- Designate areas discharging via the MS4 to Jovita Creek as high priority areas for illicit discharge detection and elimination field screening, and implement the schedules and activities identified in S5.C.8 of the Phase I permit.

Previous reports

The Annual Reports for 2014, 2015 and 2016 submitted to Ecology may be consulted for descriptions of work previously conducted for the Puyallup-White Fecal Coliform TMDL. Copies of these earlier Annual Reports can be provided upon request. These previously submitted documents include: maps of sites where bacteria screening was performed; sampling data collected; and descriptions of field and laboratory methods used in this work.

Work conducted in the Boise Creek basin, year 2017

In 2017, the following work was performed in the Boise Creek basin:

- Follow-up on a previously identified/eliminated illicit connection;
- Dry weather reconnaissance and sampling;
- Wet weather reconnaissance and sampling;
- Source tracking for suspected illicit connections; and
- Acquisition of additional qPCR (animal biomarker) data for samples collected in years 2015 and 2016.

As reported in previous Annual Reports submitted by SWS to Ecology, the illicit connections (ICs) to a County ditch found in late 2014 at the Bettine property on 248th Ave SE were ostensibly removed in mid-2015. However, elevated levels of bacteria were detected in the MS4 below the ICs in 2015 and 2016, so limited monitoring continued in 2017, before the monitoring was discontinued due to delays in installation of a new OSS at the property. The installation of a new OSS was officially approved by DPHSKC in late September 2017. In 2018, a limited number of samples will be taken in the MS4 below the Bettine property in order to confirm that the elevated *E. coli* and human waste signals have been eliminated. Also in 2018, SWS will do

follow-up sampling at the locations of two other previously eliminated ICs (Dover and Ritter), as budget allows.

Dry-season reconnaissance and sampling continued in 2017. As of the time of this writing, all locations in the Boise Creek basin where water leaves the County's MS4 have been visited, in most cases multiple times, and these visits have been documented with photos and inspection data saved in SWSS' stormwater geodatabase. There are roughly 60 such locations in the Boise Creek basin. SWSS has also walked nearly every foot of MS4 conveyance in the basin in dry weather in order to locate possible illicit sources of water, although this has not been documented in a formal manner. No illicit discharges to the MS4 were found in this manner in year 2017.

Thanks to an increased sampling budget from year 2016 to year 2017, more wet-season sampling in the MS4 was possible this year. Wet-weather sampling took place on January 18 (15 total sites, 14 submitted for qPCR analysis); February 9 (9 total sites, all submitted for qPCR); March 15 (24 total, 14 for qPCR); and May 16 (19 total; 13 for qPCR). Sampling in these events was meant to follow up on high results from sampling in years 2015 and 2016. Additionally, while most of these samples were submitted for only *E. coli*, Hu-2-Bac and Rum-2-Bac analysis, some (with high Rum-2-Bac results) were also submitted for analysis for the cattle biomarkers CowM2 and CowM3.

In May 2017, Stormwater Services made changes to its TMDL sampling program in the basin. First, the regular analysis of samples for the ruminant and cattle biomarkers was abandoned, mainly due to cost, but also due to the diminishing returns of continuing to collect these data. SWS recently produced a brief paper summarizing the ruminant and cattle data collected from 2015-2017, which identifies specific properties that appear to be sources of domestic animal waste. This paper is attached to this Annual Report. Secondly, SWS began to focus its decreasing sampling budget on the tracking of possible failing (or illicitly connected) OSS in the Boise Creek basin. By focusing on OSS, SWS complements Ecology's work with agricultural property owners that might be responsible for domestic animal waste getting into Boise Creek. Thirdly, SWS has instituted monthly *E. coli* monitoring at locations in the natural drainage network, using a proprietary, commercially available method called Coliscan© Easygel© ('Coliscans'). This is a low-cost, in-house, rapid substitute for laboratory analysis that allows SWS to continue to analyze fecal indicator bacteria in the Boise Creek basin. SWS has high confidence in the validity of *E. coli* data acquired with Coliscans.

With specific regard to SWS' current source tracking efforts, by spring of 2017 SWS had identified three separate locations in the Boise Creek basin where there was strong analytical evidence of a source of human waste. Resources in the last part of 2017 were focused on identifying the exact locations of the sources. One of the three mysteries was solved in early September 2017 when a property was identified and the property owner admitted to the illicit connection of his house's sewage system to the County's MS4. The property was referred to DPHSKC, which will require and oversee the installation of a new OSS. Source tracking at the

other two locations has continued to provide evidence of an IC, but responsible properties have not yet been identified. In addition to continued sampling in 2018, SWS is considering dye testing or use of a pipe camera to locate these sources.

A map of sites sampled in 2017 is included with this report in Figure 1.

Work conducted in the Jovita Creek basin, year 2017

Dry weather reconnaissance and sampling continued in a limited manner in the unincorporated portion of the Jovita Creek basin in 2017. As of the time this writing, all locations in the Jovita Creek basin where water leaves the County's MS4 have been visited in dry weather, in many cases multiple times, and these visits have been documented with photos and inspection data saved in SWS' stormwater geodatabase. There are roughly 100 such locations in the Jovita Creek basin. (SWS has also walked much of the MS4 conveyance in the basin in dry weather, in order to locate possible illicit sources of water, although this has not been documented in a formal manner.) No obviously suspect conditions were noted during this work such as indicators of possible failing septic systems, livestock waste runoff or other illicit discharges to the MS4.

To summarize previous FC TMDL work in Jovita, in year 2014 some field sampling in the MS4 was conducted. Locations with relatively elevated bacterial results from year 2014's sampling and analysis were revisited in years 2015 and 2016, with the goal of finding possible bacteria sources such as failing septic systems or domestic animal waste mismanagement. No such sources were ever identified.

No map of the Jovita Creek stormwater drainage system and the associated County MS4 sampling sites is provided in this report. Summaries of SWS's FC TMDL work in Jovita have been provided to Ecology in previous Annual Report submissions. These previous reports can be supplied again on request.

No FC TMDL-specific work activities are planned by SWS in the Jovita Creek basin during year 2018.

-----end of write-up. Figure 1 follows-----

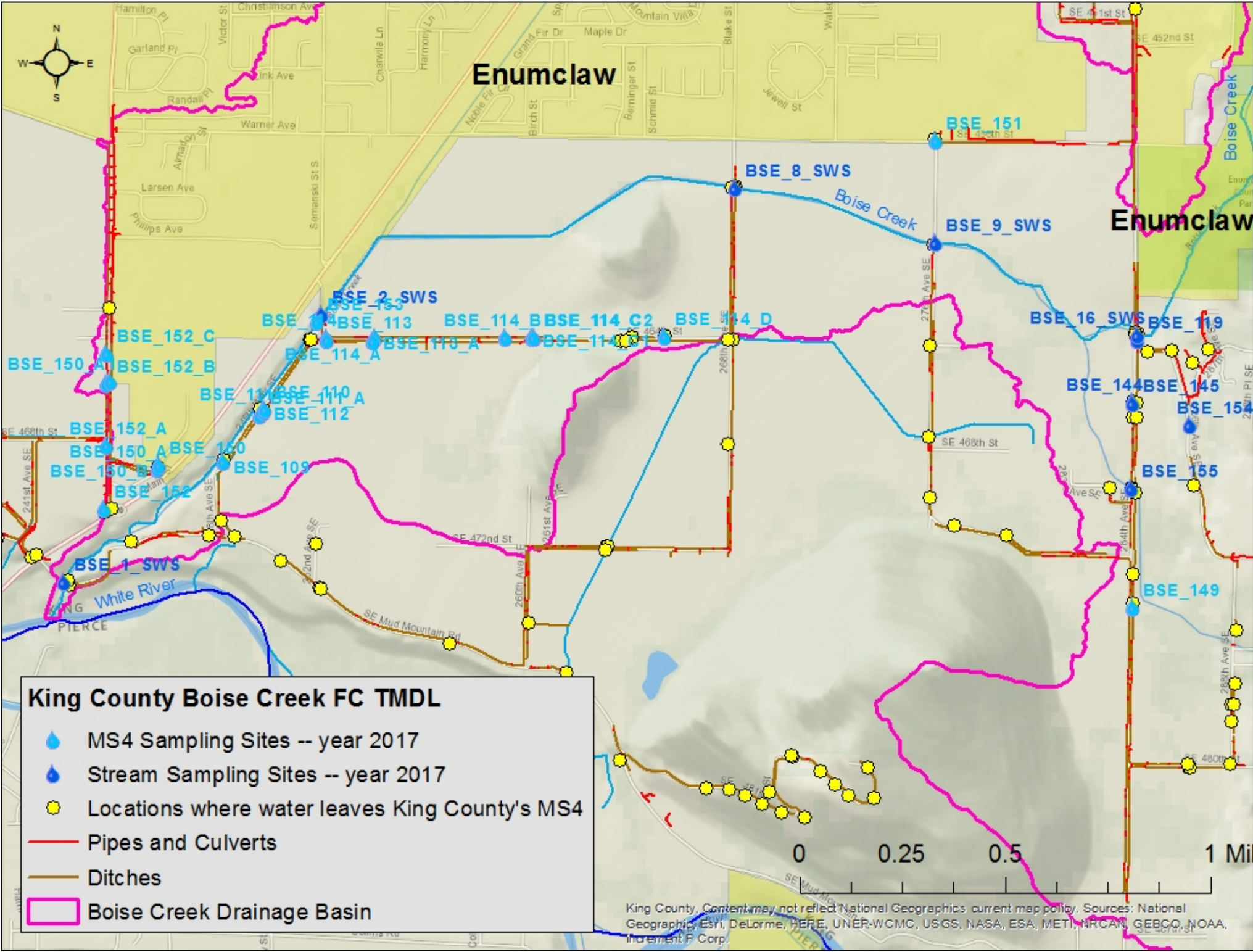


Figure 1

Attachment 2017 Annual Report Question #67:

Attach description of public education and outreach efforts conducted per S5.C.10.

2.1.10 Education and Outreach Program – S5.C.10

The SWMP shall include an education and outreach program designed to reduce or eliminate behaviors and practices that cause or contribute to adverse stormwater impacts and encourage the public to participate in stewardship activities. The education program may be developed and implemented locally or regionally.

Minimum performance measures:

- a. Each Permittee shall implement or participate in an education and outreach program that uses a variety of methods to target the audiences and topics listed below. The outreach program shall be designed to educate each target audience about the stormwater problem and provide specific actions they can follow to minimize the problem.*
 - i. To build general awareness, Permittees shall target the following audiences and subject areas:*
 - (1) General Public (including school age children), and businesses (including home-based and mobile business):*
 - *General impacts of stormwater on surface waters.*
 - *Impacts from impervious surfaces.*
 - *Impacts of illicit discharges and how to report them.*
 - *LID principles and LID BMPs.*
 - *Opportunities to become involved in stewardship activities.*
 - (2) Engineers, contractors, developers, and land use planners:*
 - *Technical standards for stormwater site and erosion control plans.*
 - *LID principles and LID BMPs.*
 - *Stormwater treatment and flow control BMPs/facilities.*
 - ii. To effect behavior change, Permittees shall target the following audiences and BMPs:*
 - (1) General public (which may include school age children) and businesses (including home-based and mobile businesses):*
 - *Use and storage of automotive chemicals, hazardous cleaning supplies, carwash soaps, and other hazardous materials.*
 - *Equipment maintenance.*
 - *Prevention of illicit discharges.*

(2) Residents, landscapers and property managers/owners:

- *Yard care techniques protective of water quality.*
- *Use and storage of pesticides and fertilizers and other household chemicals.*
- *Carpet cleaning and auto repair and maintenance.*
- *Vehicle, equipment, and home/building maintenance.*
- *Pet waste management and disposal.*
- *LID principles and LID BMPs.*
- *Stormwater facility maintenance.*
- *Dumpster and trash compactor maintenance.*

b. Each permittee shall create stewardship opportunities and/or partner with existing organizations to encourage residents to participate in activities such as stream teams, storm drain marking, volunteer monitoring, riparian plantings and education activities.

c. Each Permittee shall measure the understanding and adoption of the targeted behaviors for at least one targeted audience in at least one subject area. No later than February 2, 2016, Permittees shall use the resulting measurements to direct education and outreach resources most effectively as well as to evaluate changes in adoption of the targeted behaviors. Permittees may meet this requirement individually or as a member of a regional group.

In 2018 King County plans to participate in STORM (Stormwater Outreach for Regional Municipalities) the regional consortium that supports outreach projects in response to permit requirements. King County serves on STORM's Steering, Campaign, and Measurement committees. Regional NPDES Phase I and Phase II partners and King County rely on STORM to share resources and efforts on outreach with other Puget Sound municipalities. King County facilitates working together as a region, underwriting support to cities and counties to expand our combined reach and effectiveness using tested water quality information. STORM's reach beyond jurisdictional boundaries also provides greater impact in delivering information to new and mobile audiences.

King County, on behalf of STORM, received grant funding from Ecology for 2016-2017 for Phase 3 of the Don't Drip and Drive program. Phase 3 focused on applying and adapting the lessons learned from earlier phases and added new approaches, per S5.C.10.c requirement. The program exceeded all task objectives despite a timeline that was shortened from two years to 9 months. STORM will build on this work and continue to develop in 2018 in the following areas:

- Campaign Promotion - Incorporate messaging into an expanded multimedia regional and local advertising strategy in English and Spanish.
- Latino outreach - Spanish language strategy and outreach, audience research focus groups and online surveys, creation of a Spanish program website and tools, media and Facebook promotions, workshops with bilingual instructors.

- Leak check events - Include leak check events to improve campaign awareness and engage partners.
- Participating repair shops - Expand repair shop partnerships.
- Lube shops - New partnerships as third party representatives to share program information.
- Workshops – Expand the number and geography to reach a wider audience.
- Campaign partnerships - Continue relationships with partners and look for new partnership opportunities.
- Improved toolkits for each task to allow partners to implement tasks that work for their jurisdiction.
- Research – Continue to evaluate and refine strategy effectiveness, minimize barriers and improve motivations for repair.
- Funding - Identify a long-term funding source to continue development and implementation of Don't Drip and Drive as a model behavior change program.

STORM will continue to develop project materials and toolkits. These materials are in the [Resource Reservoir](http://www.pugetsoundstormgroup.org/) at www.pugetsoundstormgroup.org/. This is a member's only site, designed by and for permittees, new users request and account. Nonmembers may download PDFs but not access editing, uploading or reporting tools.

King County, on behalf of STORM, also received grant funding from Ecology for 2016-2017 for a STORM Coordinator and to create an online materials data tool that became the Resource Reservoir ([/www.pugetsoundstormgroup.org/](http://www.pugetsoundstormgroup.org/)). Funding was also delayed for this project, but SWSS and King County's Vets4Hire programs underwrote the coordinator position and SWSS funding supported web data tool design and build, testing, improvements and hosting. The STORM Coordinator provides administrative, research, coordination and communication support to the regional partners. The coordinator is also instrumental in the first user testing of the site, and managing the document library. Unfortunately funding for this position has not been secured for 2018.

In 2018 King County will continue additional engagement efforts including a rebuild of the Puget Sound Starts Here (PSSH) and Natural Yard Care websites. King County continues to support and participate in Puget Sound Starts Here Month and contributed to the Newspapers in Education with east King County partners as well.

King County will continue its partnership with STORM members to distribute Chinook Book apps as incentives and to reward clean water best practices and behavior change. King County uses the apps as part of the Don't Drip and Drive Spanish language outreach, offering the free app to those who took an online survey about car care. This offer helps generate new followers for Spanish language Facebook page and additional on-line survey respondents. STORM uses the app in online advertising to feature PSSH brand, messaging and practices. King County uses the app to support the ECO Net partner's activities (www.kingcoconet.org/) that help provide stewardship opportunities and share clean water messaging like PSSH.

King County Water and Land Resources Division projects that meet internal outreach requirements for 2018 are described in Appendix F. Audiences are either directly targeted in some projects, or are the secondary targets for awareness building. Some of these programs are primarily focused on stormwater related topics, or include hazardous products, stewardship, soil conservation, wastewater, or habitat restoration or protection. Pesticide related efforts discontinued by the Local Hazardous Waste Management Program are being supported by SWSS on behalf of STORM partners and are listed in Appendix F.

To support stewardship activism, King County offers storm drain labels and stencils to interested businesses, and students, and the Chinook Book apps as giveaways for nonprofits and schools to promote water quality practices. SWSS also underwrites an ongoing partnership with the ECO Net nonprofit network, sharing training and capacity building with that organization and STORM in an effort to improve environmental engagement and communications. King County also supports stewardship by supporting volunteer monitoring of water quality in about two dozen small lakes in unincorporated King County, and promoting best practices to protect lake health.

SWSS will continue to promote stormwater practices in 2018 through Natural Yard Care workshops and Stormwater Etiquette videos for businesses and residents. These programs alter stormwater impacts through awareness and behavior changes (yard and lawn care, pet waste, car washing, LID practices, vehicle leaks, etc.). SWSS will continue applying Equity and Social Justice practices to project planning and outreach.

Attachment 2017 Annual Report Question #62e:

Attach documentation of alternative catch basin inspection approach, if used (S5.C.9.d.i.(1), (2), or (3)).

As appropriate, spills and other select Incidents are reported to Ecology's Environmental Report Tracking System database.

In 2018 King County plans to make a concerted effort to ensure awareness and coordination among King County agencies around proper response, tracking, and reporting of spills and improper disposal into King County's MS4.

2.1.9 Operations and Maintenance Program – S5.C.9

Each Permittee shall implement a program to regulate maintenance activities and to conduct maintenance activities by the Permittee to prevent or reduce stormwater impacts.

Minimum performance measures:

- a. Maintenance Standards. Each Permittee shall implement maintenance standards that are as protective, or more protective, of facility function than those specified in Chapter 4 of Volume V of the Stormwater Management Manual for Western Washington. For facilities which do not have maintenance standards, the Permittee shall develop a maintenance standard. No later than June 30, 2015 each Permittee shall update their maintenance standards as necessary to meet the requirements in this section.*
 - i. The purpose of the maintenance standard is to determine if maintenance is required. The maintenance standard is not a measure of the facility's required condition at all times between inspections. Exceeding the maintenance standard between inspections and/or maintenance is not a permit violation.*
 - ii. Unless there are circumstances beyond the Permittee's control, when an inspection identifies an exceedance of the maintenance standard, maintenance shall be performed:*
 - (1) Within 1 year for typical maintenance of facilities, except catch basins.*
 - (2) Within 6 months for catch basins.*
 - (3) Within 2 years for maintenance that requires capital construction of less than \$25,000.*

Circumstances beyond the Permittee's control include denial or delay of access by property owners, denial or delay of necessary permit approvals, and unexpected reallocations of maintenance staff to perform emergency work. For each exceedance of the required timeframe, the Permittee shall document the circumstances and how they were beyond the Permittee's control.

The 2016 SWDM sets forth the maintenance standards for stormwater facilities in King County per KCC 9.04. King County published its first SWDM in 1990 and revisions and updates have occurred since then as new facility features are developed or standards change. To comply with S5.C.9.a, King County updated the SWDM and related codes to include maintenance standards for LID BMPs, effective as of April 24, 2016.

Maintenance of stormwater treatment and flow control BMPs/facilities (facilities) is typically initiated by one of the following inspections:

- Inspections of facilities regulated by King County are conducted according to the description under S5.C.9.b, below.
- Inspections of facilities owned or operated by King County are conducted according to the description under S5.C.9.c, below.
- Privately owned facilities are inspected every other year by King County. In alternating years, King County requires facility owners to conduct self-certified inspections.

When any of the inspections referenced above identify an exceedance of a function-critical maintenance standard requiring typical maintenance, that maintenance is conducted within the one year timeline allowed by the Permit. If the maintenance is more substantial and requires capital funds, up to \$25,000, the facility is added to the Facility Remediation Program and the maintenance is completed within the two-year timeline allowed by the Permit.

Catch basins owned or operated by King County are inspected according to the description under S5.C.9.d, below. When a catch basin inspection identifies an exceedance of a function-critical maintenance standard, (i.e. one that has the potential to negatively impact water quality), that maintenance is conducted within the six-month timeline allowed by the Permit.

As development and redevelopment projects add increasing numbers of LID BMPs to the County's stormwater infrastructure inventory, King County will be responsible for inspecting and/or maintaining more and more non-traditional stormwater controls. LID is relatively new and knowledge of effective maintenance practices is limited, which means that the County will have to adaptively manage its approach to inspection and maintenance of LID BMPs. This will likely require development of new maintenance techniques, potentially with new types of equipment, and training of County personnel involved in this body of work.

b. Maintenance of stormwater facilities regulated by the Permittee:

i. Each Permittee shall evaluate and, if necessary, update existing ordinances or other enforceable documents requiring maintenance of all permanent stormwater treatment and flow control BMPs/facilities regulated by the Permittee (including catch basins that are part of the facilities regulated by the Permittee), in accordance with maintenance standards established under S5.C.9.a., above.

ii. Each Permittee shall implement an on-going inspection program to annually inspect all stormwater treatment and flow control BMPs/facilities regulated by the Permittee to enforce compliance with adopted maintenance standards as needed based on inspection. The inspection program is limited to facilities to which the Permittee can legally gain access, provided the Permittee shall seek access to all stormwater treatment and flow control BMPs/facilities regulated by the permittee.

Permittees may reduce the inspection frequency based on maintenance records of double the length of time of the proposed inspection frequency. In the absence of maintenance records, the Permittee may substitute written statements to document a specific less frequent inspection schedule. Written statements shall be based on actual inspection and maintenance experience and shall be certified in accordance with G19 Certification and Signature.

iii. Each Permittee shall manage maintenance activities to inspect all permanent stormwater treatment and flow control BMPs/facilities, and catch basins, in new residential developments every six months, until 90% of the lots are constructed (or when construction has stopped and the site is fully stabilized), to identify maintenance needs and enforce compliance with maintenance standards as needed.

iv. Compliance with the inspection requirements of S5.C.9.b.ii and iii, above, shall be determined by the presence of an established inspection program designed to inspect all sites, and achieving inspection of 80% of all sites.

v. The Permittee shall require cleaning of catch basins regulated by the Permittee if they are found to be out of compliance with established maintenance standards in the course of inspections conducted at facilities under the requirements of S5.C.7. Source Control Program for Existing Development, and S5.C.8. Illicit Connections and Illicit Discharges Detection and Elimination, or if the catch basins are part of the stormwater facilities inspected under the requirements of S5.C.9. Operation and Maintenance Program.

The following KCCs authorize King County personnel to inspect and require maintenance of stormwater facilities.

- KCC 9.04.050 states that “Maintenance of all drainage facilities in compliance with King County maintenance standards is the responsibility of the applicant or property owner as described in the Surface Water Design Manual, except those facilities for which King County assumes maintenance and operation as described in K.C.C 9.04.115 and 9.04.120 and the Surface Water Design Manual”.
- KCC 9.12.140 gives the director authorization to “make such inspections and take all actions that may be required to enforce this chapter”.

Additionally, developers are required to record easements and covenants providing the County with right-of-entry and inspection of private drainage and stormwater control systems.

Private facilities regulated by King County are inspected per Permit requirements. Inspections are generally conducted between July and October.

In any given year, half of the private commercial facility inventory is visited by an inspector to confirm full compliance based on the maintenance standards in the SWDM. If any deficiencies are discovered, a Maintenance Correction Letter is sent, giving the property owner sufficient time to correct the problem before the end of the year. The property owner notifies SWSS when the work has been completed. Extensions may be granted if circumstances warrant and permit timelines can accommodate the extension. Progressive enforcement may be used when maintenance is not completed within the timelines specified by the County.

The other half of the private commercial facilities regulated by King County complete a self-certified inspection in which they confirm full functionality of all facilities on their property.

For those properties with a history of consistent compliance, the inspection frequency may be reduced based on maintenance records.

All compliance activities are tracked using a proprietary Maintenance Information System (MIS). At the end of the year, SWSS provides a SWM Fee discount report to the WLRD SWM Fee billing supervisor who then gives the report to the King County Department of Assessments. Property owners in compliance receive a SWM fee discount.

c. *Maintenance of stormwater facilities owned or operated by the Permittee*

- i. *Each Permittee shall implement a program to annually inspect all permanent stormwater treatment and flow control BMPs/facilities owned or operated by the Permittee. Permittees shall implement appropriate maintenance action(s) in accordance with adopted maintenance standards.*

Permittees may reduce the inspection frequency based on maintenance records of double the length of time of the proposed inspection frequency. In the absence of maintenance records, the Permittee may substitute written statements to document a specific less frequent inspection schedule. Written statements shall be based on actual inspection and maintenance experience and shall be certified in accordance with G19 Certification and Signature.

- ii. *Each Permittee shall implement a program to conduct spot checks of potentially damaged permanent stormwater treatment and flow control BMPs/facilities after major storm events (24 hour storm event with a 10 year or greater recurrence interval). If spot checks indicate widespread damage/maintenance needs, inspect all stormwater treatment and flow control BMPs/facilities that may be affected. Conduct repairs or take appropriate maintenance action in accordance with maintenance standards established under S5.C.9.a., above, based on the results of the inspections.*

- iii. *Compliance with the inspection requirements of S5.C.9.c.i., and ii. above, shall be determined by the presence of an established inspection program designed to inspect all sites and achieving at least 95% of required inspections.*

King County owned or operated facilities fall into two general categories: residential facilities serving subdivisions and facilities associated with County properties.

SWSS is responsible for inspecting and maintaining approximately 1,100 residential facilities in unincorporated King County and cities with which the County contracts. As with private facilities, residential facilities with consistent compliance may be eligible for a phased inspection schedule.

SWSS uses Roads crews and vendor contractors to perform facility maintenance. Field inspection data for these facilities are entered into MIS by the inspector, resulting in a work authorization in MIS from which the Roads crew supervisor accesses and assigns the work to be completed within the permit allotted time.

Inspectors also identify noxious weed removal needs and capital repairs or corrections, if needed. Additionally, citizen complaints may warrant a site inspection to identify corrections. The maximum duration between inspections is three years, but problem sites may require annual inspections and maintenance.

Inspection and maintenance of facilities associated with King County properties are the responsibility of the custodial agency. Custodial facility inspections are conducted by SWSS or the custodial agency and range in frequency from several times per year to once annually.

Spot inspections conducted after large rain events are performed by the respective custodial agencies and focus on the areas of greatest rainfall intensity based on rain gauge data.

We target 100 percent of the facilities owned or operated by King County and at least 95 percent of required inspections are completed annually.

d. Maintenance of Catch Basins Owned or Operated by the Permittee

- i. Each Permittee shall annually inspect catch basins and inlets owned or operated by the Permittee, or implement alternatives below.*

Alternatives to the standard approach of inspecting catch basins annually: Permittees may apply the following alternatives to all or portions of their system.

- (1) The annual catch basin inspection schedule may be changed as appropriate to meet the maintenance standards based on maintenance records of double the length of time of the proposed inspection frequency. In the absence of maintenance records for catch basins, the Permittee may substitute written statements to document a specific, less frequent inspection schedule. Written statements shall be based on actual inspection and maintenance experience and shall be certified in accordance with G19 Certification and Signature.*
- (2) Annual inspections may be conducted on a “circuit basis” whereby 25% of catch basins and inlets within each circuit are inspected to identify maintenance needs. Include an inspection of the catch basin immediately upstream of any system outfall or discharge point, if applicable. Clean all catch basins within a given circuit for which the inspection indicates cleaning is needed to comply with maintenance standards established under S5.C.9.a., above.*
- (3) The Permittee may clean all pipes, ditches, catch basins, and inlets within a circuit once during the permit term. Circuits selected for this alternative must drain to a single point.*

- ii. The disposal of decant water shall be in accordance with the requirements in Appendix 6 – Street Waste Disposal.*

- iii. Compliance with the inspection requirements of S5.C.9.d.i. above, shall be determined by the presence of an established inspection program designed to inspect all catch basins and achieving at least 95% of required inspections.*

Each custodial agency within King County is responsible for the inspection and maintenance of their respective properties and associated stormwater assets.

Of the custodial agencies, Roads carries the largest catch basin inventory. Roads implements a circuit-based inspection and maintenance program for catch basins and inlets in the road ROW. The circuit approach focuses on the inspection of a subset of catch basins in each drainage circuit to determine where to focus maintenance activities. The program includes annual staff training, completion of inspection checklists, data input into a geospatial database, data quality assurance/quality control,

work order generation, requisite maintenance, and documentation of maintenance activities.

SWD, WTD, Parks, and FMD each have a relatively small number of catch basins (typically less than 500) in their facility inventory. These agencies inspect 100 percent of their catch basin inventory at least annually, with a very limited number on a modified schedule, and conduct maintenance on those that fail to meet the maintenance standards found in the SWDM. WTD addresses catch basins that accumulate sediment infrequently on a rotational inspection and maintenance basis, while those needing regular maintenance are inspected annually.

To address maintenance challenges related to operating an airport, KCIA uses an alternative approach due to several airport operation challenges, which is in accordance with S5.C.9.d.i. (3). KCIA performs enhanced daily mechanical sweeping of paved areas. It has established east, west, and central catch basin cleaning activity circuits and cleans all pipes, ditches, catch basins, and inlets in each circuit once during the permit term. The alternative cleaning schedule repeats every three years. Each circuit drains to a single point. Results of annual stormwater facility inspections, annual IC/IDDE inspections, and daily pavement sweeping show that this frequency is optimal. The east circuit was cleaned in November 2015 and the central in June 2016. The west circuit was cleaned in 2017. For the 2015-17 cleaning cycle, line cleaning and video inspection were also performed.

Oil water separators at the KCIA are maintained weekly. Catch basins are also cleaned on an as-needed basis in accordance with the Airport's Spill Response Policy and the occurrence of construction activities. The KCIA tenants are required to clean their catch basins and sweep as well.

KCIA performs these activities in compliance with its Industrial Stormwater General Permit (ISGP) requirements. ISGP SWPPP requirements include monthly facility inspections, quarterly stormwater discharge monitoring and reporting, corrective actions, training, and annual reporting.

Roads operates a regional stormwater decant station in Renton and temporary decant stations at three other maintenance facilities run by Roads. Transit operates its own decant station at one of its Tukwila properties. These decant stations are a key element in the disposal of stormwater removed from the County's MS4 during catch basin cleaning activities. All stormwater accepted at these decant stations is disposed of through the sanitary sewer.

All maintenance needs identified through inspections are addressed within the timelines established in S5.C.9.a.ii.

- e. Each Permittee shall implement practices, policies, and procedures to reduce stormwater impacts associated with runoff from all lands owned or maintained by the Permittee, and road maintenance activities under the functional control of the Permittee. Lands owned or maintained by the Permittee include, but are not limited to: parking lots, streets, roads, highways, buildings, parks, open space, road ROW, maintenance yards, and stormwater treatment and flow control BMPs/facilities.*

The following activities shall be addressed:

- i. Pipe cleaning*
- ii. Cleaning of culverts that convey stormwater in ditch systems*
- iii. Ditch maintenance*
- iv. Street cleaning*
- v. Road repair and resurfacing, including pavement grinding*
- vi. Snow and ice control*
- vii. Utility installation*
- viii. Maintaining roadside areas, including vegetation management*
- ix. Dust control*
- x. Pavement striping maintenance*
- xi. Application of fertilizers, pesticides, and herbicides according to the instructions for their use, including reducing nutrients and pesticides using alternatives that minimize environmental impacts*
- xii. Sediment and erosion control*
- xiii. Landscape maintenance and vegetation disposal*
- xiv. Trash and pet waste management*
- xv. Building exterior cleaning and maintenance*

The County has several programs that establish practices for reducing stormwater impacts associated with runoff from parking lots, streets, roads, and highways owned, maintained, or operated by the County. Custodial agencies are responsible for developing an inventory of their properties, and developing and implementing an inspection and maintenance program. The inspection programs for most custodial agencies are based on a tiered program using metrics such as the presence of structures, potential pollution generating activities, public access, property size, and proximity of water bodies to prioritize the risk of pollution impacts for each site. These Inspection frequencies range from single to multiyear depending on the level of risk.

In 2009, SWSS produced a draft document that consolidated the operations and maintenance BMPs from numerous King County program documents. These BMPs are designed to reduce stormwater impacts associated with the operations and maintenance activities referred to in S5.C.9.e. Called the SiMPla (Site Management Plan), it has been issued to the County's custodial agencies to be used as the minimum standard for operations and maintenance of properties owned or maintained by King County. In 2012, an updated, revised, and reformatted version of the SiMPla was completed and distributed not only within King County but amongst other Phase I and Phase II municipalities in the region for their use/reference. In addition, a dedicated SiMPla website was developed at

<http://www.kingcounty.gov/environment/waterandland/stormwater/documents/site-management-plan.aspx> to allow for easy navigation and access to the document and its contents. The 2012 document includes sections of the following:

- the Regional Road Maintenance ESA Program Guidelines,
- the draft Maintenance Performance Standards (King County Department of Transportation, 2008),
- Draft Stormwater Management Manual for Western Washington (Ecology, 2011)
- the SPPM (DNRP, 2009), and
- the Integrated Pest Management Program guidelines (Department of Executive Services, 2012).

Several agencies have internal manuals and programs that are as, or more, protective of stormwater quality as the baseline requirements found in the SiMPla and are used by those agencies as equivalent programs. Additionally, King County properties under NPDES industrial stormwater permits have SWPPPs, which are used instead of the SiMPla.

f. Implement an ongoing training program for employees of the Permittee who have primary construction, operations or maintenance job functions that may impact stormwater quality. The training program shall address the importance of protecting water quality, operation and maintenance standards, inspection procedures, selecting appropriate BMPs, ways to perform their job activities to prevent or minimize impacts to water quality, and procedures for reporting water quality concerns. Follow-up training shall be provided as needed to address changes in procedures, techniques, requirements, or staffing. Permittees shall document and maintain records of the training provided and the staff trained.

King County offers a number of training programs within various agencies for personnel in positions that have construction, or operations and maintenance job functions that could impact stormwater quality.

King County Roads has conducted annual in-house training of all their field staff and appropriate support staff since 2002. The training is tailored specifically for the operations and maintenance staff at Roads and addresses, among other subjects, stormwater pollution prevention, spill response, and aquifer protection. In addition, Roads field crews participate in the Regional Road Maintenance ESA Program training

series (Track 1, 2 & 3). This training focuses on BMP practices and uses, maintenance guidelines, design criteria, and habitat requirements.

FMD has established a training program that focuses on general stormwater awareness, IC/IDDE and basic spill response for all the trades and janitorial staff. Trades that perform operations and maintenance work on building exteriors and grounds also receive training on the use of the SiMPla.

Select positions across several agencies require CESCL training. This training is available in-house (Ecology-approved) or through qualified vendors.

SWSS conducts an ongoing review of County programs to identify activities and positions whose operations and maintenance activities could impact stormwater quality. Training records are currently managed by each agency. These trainings are hosted and tracked on a SharePoint based Stormwater Classroom webpage along with a library of records on individuals who have taken those trainings.

- g. *Implement a SWPPP for all heavy equipment maintenance or storage yards, and material storage facilities owned or operated by the Permittee in areas subject to this permit that are not required to have coverage under the General NPDES Permit for Stormwater Discharges Associated with Industrial Activities or another NPDES permit that authorizes stormwater discharges associated with the activity. A schedule for implementation of structural BMPs shall be included in the SWPPP. Generic SWPPPs that can be applied at multiple sites may be used to comply with this requirement. The SWPPP shall include periodic visual observation of discharges from the facility to evaluate the effectiveness of BMPs.*

Under the previous permits, King County reviewed an inventory of all known County-owned properties subject to this permit condition. Properties that had existing SWPPPs continued to implement them. New SWPPPs were developed and implemented for properties that did not already have SWPPPs. All SWPPP-covered properties continue to implement appropriate BMPs under the Permit.

As King County acquires or becomes aware of additional properties subject to this Permit condition, new SWPPPs will be developed and implemented.

h. Maintain records of inspections and maintenance or repair activities conducted by the Permittee.

Stormwater-related inspection and maintenance programs exist in several King County agencies, each with their own record-keeping systems. All agencies conducting inspections or maintenance activities germane to the Permit track those actions and maintain those records for a period of no less than five years.

Attachment 2017 Annual Report Question #59:

If reduced inspection frequency for municipally owned or operated stormwater treatment and flow control BMPs/facilities for the first time during this permit cycle, attach documentation per S5.C.9.c.i.

As appropriate, spills and other select Incidents are reported to Ecology's Environmental Report Tracking System database.

In 2018 King County plans to make a concerted effort to ensure awareness and coordination among King County agencies around proper response, tracking, and reporting of spills and improper disposal into King County's MS4.

2.1.9 Operations and Maintenance Program – S5.C.9

Each Permittee shall implement a program to regulate maintenance activities and to conduct maintenance activities by the Permittee to prevent or reduce stormwater impacts.

Minimum performance measures:

- a. Maintenance Standards. Each Permittee shall implement maintenance standards that are as protective, or more protective, of facility function than those specified in Chapter 4 of Volume V of the Stormwater Management Manual for Western Washington. For facilities which do not have maintenance standards, the Permittee shall develop a maintenance standard. No later than June 30, 2015 each Permittee shall update their maintenance standards as necessary to meet the requirements in this section.*
 - i. The purpose of the maintenance standard is to determine if maintenance is required. The maintenance standard is not a measure of the facility's required condition at all times between inspections. Exceeding the maintenance standard between inspections and/or maintenance is not a permit violation.*
 - ii. Unless there are circumstances beyond the Permittee's control, when an inspection identifies an exceedance of the maintenance standard, maintenance shall be performed:*
 - (1) Within 1 year for typical maintenance of facilities, except catch basins.*
 - (2) Within 6 months for catch basins.*
 - (3) Within 2 years for maintenance that requires capital construction of less than \$25,000.*

Circumstances beyond the Permittee's control include denial or delay of access by property owners, denial or delay of necessary permit approvals, and unexpected reallocations of maintenance staff to perform emergency work. For each exceedance of the required timeframe, the Permittee shall document the circumstances and how they were beyond the Permittee's control.

The 2016 SWDM sets forth the maintenance standards for stormwater facilities in King County per KCC 9.04. King County published its first SWDM in 1990 and revisions and updates have occurred since then as new facility features are developed or standards change. To comply with S5.C.9.a, King County updated the SWDM and related codes to include maintenance standards for LID BMPs, effective as of April 24, 2016.

Maintenance of stormwater treatment and flow control BMPs/facilities (facilities) is typically initiated by one of the following inspections:

- Inspections of facilities regulated by King County are conducted according to the description under S5.C.9.b, below.
- Inspections of facilities owned or operated by King County are conducted according to the description under S5.C.9.c, below.
- Privately owned facilities are inspected every other year by King County. In alternating years, King County requires facility owners to conduct self-certified inspections.

When any of the inspections referenced above identify an exceedance of a function-critical maintenance standard requiring typical maintenance, that maintenance is conducted within the one year timeline allowed by the Permit. If the maintenance is more substantial and requires capital funds, up to \$25,000, the facility is added to the Facility Remediation Program and the maintenance is completed within the two-year timeline allowed by the Permit.

Catch basins owned or operated by King County are inspected according to the description under S5.C.9.d, below. When a catch basin inspection identifies an exceedance of a function-critical maintenance standard, (i.e. one that has the potential to negatively impact water quality), that maintenance is conducted within the six-month timeline allowed by the Permit.

As development and redevelopment projects add increasing numbers of LID BMPs to the County's stormwater infrastructure inventory, King County will be responsible for inspecting and/or maintaining more and more non-traditional stormwater controls. LID is relatively new and knowledge of effective maintenance practices is limited, which means that the County will have to adaptively manage its approach to inspection and maintenance of LID BMPs. This will likely require development of new maintenance techniques, potentially with new types of equipment, and training of County personnel involved in this body of work.

b. Maintenance of stormwater facilities regulated by the Permittee:

i. Each Permittee shall evaluate and, if necessary, update existing ordinances or other enforceable documents requiring maintenance of all permanent stormwater treatment and flow control BMPs/facilities regulated by the Permittee (including catch basins that are part of the facilities regulated by the Permittee), in accordance with maintenance standards established under S5.C.9.a., above.

ii. Each Permittee shall implement an on-going inspection program to annually inspect all stormwater treatment and flow control BMPs/facilities regulated by the Permittee to enforce compliance with adopted maintenance standards as needed based on inspection. The inspection program is limited to facilities to which the Permittee can legally gain access, provided the Permittee shall seek access to all stormwater treatment and flow control BMPs/facilities regulated by the permittee.

Permittees may reduce the inspection frequency based on maintenance records of double the length of time of the proposed inspection frequency. In the absence of maintenance records, the Permittee may substitute written statements to document a specific less frequent inspection schedule. Written statements shall be based on actual inspection and maintenance experience and shall be certified in accordance with G19 Certification and Signature.

iii. Each Permittee shall manage maintenance activities to inspect all permanent stormwater treatment and flow control BMPs/facilities, and catch basins, in new residential developments every six months, until 90% of the lots are constructed (or when construction has stopped and the site is fully stabilized), to identify maintenance needs and enforce compliance with maintenance standards as needed.

iv. Compliance with the inspection requirements of S5.C.9.b.ii and iii, above, shall be determined by the presence of an established inspection program designed to inspect all sites, and achieving inspection of 80% of all sites.

v. The Permittee shall require cleaning of catch basins regulated by the Permittee if they are found to be out of compliance with established maintenance standards in the course of inspections conducted at facilities under the requirements of S5.C.7. Source Control Program for Existing Development, and S5.C.8. Illicit Connections and Illicit Discharges Detection and Elimination, or if the catch basins are part of the stormwater facilities inspected under the requirements of S5.C.9. Operation and Maintenance Program.

The following KCCs authorize King County personnel to inspect and require maintenance of stormwater facilities.

- KCC 9.04.050 states that “Maintenance of all drainage facilities in compliance with King County maintenance standards is the responsibility of the applicant or property owner as described in the Surface Water Design Manual, except those facilities for which King County assumes maintenance and operation as described in K.C.C 9.04.115 and 9.04.120 and the Surface Water Design Manual”.
- KCC 9.12.140 gives the director authorization to “make such inspections and take all actions that may be required to enforce this chapter”.

Additionally, developers are required to record easements and covenants providing the County with right-of-entry and inspection of private drainage and stormwater control systems.

Private facilities regulated by King County are inspected per Permit requirements. Inspections are generally conducted between July and October.

In any given year, half of the private commercial facility inventory is visited by an inspector to confirm full compliance based on the maintenance standards in the SWDM. If any deficiencies are discovered, a Maintenance Correction Letter is sent, giving the property owner sufficient time to correct the problem before the end of the year. The property owner notifies SWSS when the work has been completed. Extensions may be granted if circumstances warrant and permit timelines can accommodate the extension. Progressive enforcement may be used when maintenance is not completed within the timelines specified by the County.

The other half of the private commercial facilities regulated by King County complete a self-certified inspection in which they confirm full functionality of all facilities on their property.

For those properties with a history of consistent compliance, the inspection frequency may be reduced based on maintenance records.

All compliance activities are tracked using a proprietary Maintenance Information System (MIS). At the end of the year, SWSS provides a SWM Fee discount report to the WLRD SWM Fee billing supervisor who then gives the report to the King County Department of Assessments. Property owners in compliance receive a SWM fee discount.

c. *Maintenance of stormwater facilities owned or operated by the Permittee*

- i. *Each Permittee shall implement a program to annually inspect all permanent stormwater treatment and flow control BMPs/facilities owned or operated by the Permittee. Permittees shall implement appropriate maintenance action(s) in accordance with adopted maintenance standards.*

Permittees may reduce the inspection frequency based on maintenance records of double the length of time of the proposed inspection frequency. In the absence of maintenance records, the Permittee may substitute written statements to document a specific less frequent inspection schedule. Written statements shall be based on actual inspection and maintenance experience and shall be certified in accordance with G19 Certification and Signature.

- ii. *Each Permittee shall implement a program to conduct spot checks of potentially damaged permanent stormwater treatment and flow control BMPs/facilities after major storm events (24 hour storm event with a 10 year or greater recurrence interval). If spot checks indicate widespread damage/maintenance needs, inspect all stormwater treatment and flow control BMPs/facilities that may be affected. Conduct repairs or take appropriate maintenance action in accordance with maintenance standards established under S5.C.9.a., above, based on the results of the inspections.*

- iii. *Compliance with the inspection requirements of S5.C.9.c.i., and ii. above, shall be determined by the presence of an established inspection program designed to inspect all sites and achieving at least 95% of required inspections.*

King County owned or operated facilities fall into two general categories: residential facilities serving subdivisions and facilities associated with County properties.

SWSS is responsible for inspecting and maintaining approximately 1,100 residential facilities in unincorporated King County and cities with which the County contracts. As with private facilities, residential facilities with consistent compliance may be eligible for a phased inspection schedule.

SWSS uses Roads crews and vendor contractors to perform facility maintenance. Field inspection data for these facilities are entered into MIS by the inspector, resulting in a work authorization in MIS from which the Roads crew supervisor accesses and assigns the work to be completed within the permit allotted time.

Inspectors also identify noxious weed removal needs and capital repairs or corrections, if needed. Additionally, citizen complaints may warrant a site inspection to identify corrections. The maximum duration between inspections is three years, but problem sites may require annual inspections and maintenance.

Inspection and maintenance of facilities associated with King County properties are the responsibility of the custodial agency. Custodial facility inspections are conducted by SWSS or the custodial agency and range in frequency from several times per year to once annually.

Spot inspections conducted after large rain events are performed by the respective custodial agencies and focus on the areas of greatest rainfall intensity based on rain gauge data.

We target 100 percent of the facilities owned or operated by King County and at least 95 percent of required inspections are completed annually.

d. Maintenance of Catch Basins Owned or Operated by the Permittee

- i. Each Permittee shall annually inspect catch basins and inlets owned or operated by the Permittee, or implement alternatives below.*

Alternatives to the standard approach of inspecting catch basins annually: Permittees may apply the following alternatives to all or portions of their system.

- (1) The annual catch basin inspection schedule may be changed as appropriate to meet the maintenance standards based on maintenance records of double the length of time of the proposed inspection frequency. In the absence of maintenance records for catch basins, the Permittee may substitute written statements to document a specific, less frequent inspection schedule. Written statements shall be based on actual inspection and maintenance experience and shall be certified in accordance with G19 Certification and Signature.*
- (2) Annual inspections may be conducted on a “circuit basis” whereby 25% of catch basins and inlets within each circuit are inspected to identify maintenance needs. Include an inspection of the catch basin immediately upstream of any system outfall or discharge point, if applicable. Clean all catch basins within a given circuit for which the inspection indicates cleaning is needed to comply with maintenance standards established under S5.C.9.a., above.*
- (3) The Permittee may clean all pipes, ditches, catch basins, and inlets within a circuit once during the permit term. Circuits selected for this alternative must drain to a single point.*

- ii. The disposal of decant water shall be in accordance with the requirements in Appendix 6 – Street Waste Disposal.*

- iii. Compliance with the inspection requirements of S5.C.9.d.i. above, shall be determined by the presence of an established inspection program designed to inspect all catch basins and achieving at least 95% of required inspections.*

Each custodial agency within King County is responsible for the inspection and maintenance of their respective properties and associated stormwater assets.

Of the custodial agencies, Roads carries the largest catch basin inventory. Roads implements a circuit-based inspection and maintenance program for catch basins and inlets in the road ROW. The circuit approach focuses on the inspection of a subset of catch basins in each drainage circuit to determine where to focus maintenance activities. The program includes annual staff training, completion of inspection checklists, data input into a geospatial database, data quality assurance/quality control,

work order generation, requisite maintenance, and documentation of maintenance activities.

SWD, WTD, Parks, and FMD each have a relatively small number of catch basins (typically less than 500) in their facility inventory. These agencies inspect 100 percent of their catch basin inventory at least annually, with a very limited number on a modified schedule, and conduct maintenance on those that fail to meet the maintenance standards found in the SWDM. WTD addresses catch basins that accumulate sediment infrequently on a rotational inspection and maintenance basis, while those needing regular maintenance are inspected annually.

To address maintenance challenges related to operating an airport, KCIA uses an alternative approach due to several airport operation challenges, which is in accordance with S5.C.9.d.i. (3). KCIA performs enhanced daily mechanical sweeping of paved areas. It has established east, west, and central catch basin cleaning activity circuits and cleans all pipes, ditches, catch basins, and inlets in each circuit once during the permit term. The alternative cleaning schedule repeats every three years. Each circuit drains to a single point. Results of annual stormwater facility inspections, annual IC/IDDE inspections, and daily pavement sweeping show that this frequency is optimal. The east circuit was cleaned in November 2015 and the central in June 2016. The west circuit was cleaned in 2017. For the 2015-17 cleaning cycle, line cleaning and video inspection were also performed.

Oil water separators at the KCIA are maintained weekly. Catch basins are also cleaned on an as-needed basis in accordance with the Airport's Spill Response Policy and the occurrence of construction activities. The KCIA tenants are required to clean their catch basins and sweep as well.

KCIA performs these activities in compliance with its Industrial Stormwater General Permit (ISGP) requirements. ISGP SWPPP requirements include monthly facility inspections, quarterly stormwater discharge monitoring and reporting, corrective actions, training, and annual reporting.

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All maintenance needs identified through inspections are addressed within the timelines established in S5.C.9.a.ii.

- e. Each Permittee shall implement practices, policies, and procedures to reduce stormwater impacts associated with runoff from all lands owned or maintained by the Permittee, and road maintenance activities under the functional control of the Permittee. Lands owned or maintained by the Permittee include, but are not limited to: parking lots, streets, roads, highways, buildings, parks, open space, road ROW, maintenance yards, and stormwater treatment and flow control BMPs/facilities.*

The following activities shall be addressed:

- i. Pipe cleaning*
- ii. Cleaning of culverts that convey stormwater in ditch systems*
- iii. Ditch maintenance*
- iv. Street cleaning*
- v. Road repair and resurfacing, including pavement grinding*
- vi. Snow and ice control*
- vii. Utility installation*
- viii. Maintaining roadside areas, including vegetation management*
- ix. Dust control*
- x. Pavement striping maintenance*
- xi. Application of fertilizers, pesticides, and herbicides according to the instructions for their use, including reducing nutrients and pesticides using alternatives that minimize environmental impacts*
- xii. Sediment and erosion control*
- xiii. Landscape maintenance and vegetation disposal*
- xiv. Trash and pet waste management*
- xv. Building exterior cleaning and maintenance*

The County has several programs that establish practices for reducing stormwater impacts associated with runoff from parking lots, streets, roads, and highways owned, maintained, or operated by the County. Custodial agencies are responsible for developing an inventory of their properties, and developing and implementing an inspection and maintenance program. The inspection programs for most custodial agencies are based on a tiered program using metrics such as the presence of structures, potential pollution generating activities, public access, property size, and proximity of water bodies to prioritize the risk of pollution impacts for each site. These Inspection frequencies range from single to multiyear depending on the level of risk.

In 2009, SWSS produced a draft document that consolidated the operations and maintenance BMPs from numerous King County program documents. These BMPs are designed to reduce stormwater impacts associated with the operations and maintenance activities referred to in S5.C.9.e. Called the SiMPla (Site Management Plan), it has been issued to the County's custodial agencies to be used as the minimum standard for operations and maintenance of properties owned or maintained by King County. In 2012, an updated, revised, and reformatted version of the SiMPla was completed and distributed not only within King County but amongst other Phase I and Phase II municipalities in the region for their use/reference. In addition, a dedicated SiMPla website was developed at

<http://www.kingcounty.gov/environment/waterandland/stormwater/documents/site-management-plan.aspx> to allow for easy navigation and access to the document and its contents. The 2012 document includes sections of the following:

- the Regional Road Maintenance ESA Program Guidelines,
- the draft Maintenance Performance Standards (King County Department of Transportation, 2008),
- Draft Stormwater Management Manual for Western Washington (Ecology, 2011)
- the SPPM (DNRP, 2009), and
- the Integrated Pest Management Program guidelines (Department of Executive Services, 2012).

Several agencies have internal manuals and programs that are as, or more, protective of stormwater quality as the baseline requirements found in the SiMPla and are used by those agencies as equivalent programs. Additionally, King County properties under NPDES industrial stormwater permits have SWPPPs, which are used instead of the SiMPla.

f. Implement an ongoing training program for employees of the Permittee who have primary construction, operations or maintenance job functions that may impact stormwater quality. The training program shall address the importance of protecting water quality, operation and maintenance standards, inspection procedures, selecting appropriate BMPs, ways to perform their job activities to prevent or minimize impacts to water quality, and procedures for reporting water quality concerns. Follow-up training shall be provided as needed to address changes in procedures, techniques, requirements, or staffing. Permittees shall document and maintain records of the training provided and the staff trained.

King County offers a number of training programs within various agencies for personnel in positions that have construction, or operations and maintenance job functions that could impact stormwater quality.

King County Roads has conducted annual in-house training of all their field staff and appropriate support staff since 2002. The training is tailored specifically for the operations and maintenance staff at Roads and addresses, among other subjects, stormwater pollution prevention, spill response, and aquifer protection. In addition, Roads field crews participate in the Regional Road Maintenance ESA Program training

series (Track 1, 2 & 3). This training focuses on BMP practices and uses, maintenance guidelines, design criteria, and habitat requirements.

FMD has established a training program that focuses on general stormwater awareness, IC/IDDE and basic spill response for all the trades and janitorial staff. Trades that perform operations and maintenance work on building exteriors and grounds also receive training on the use of the SiMPla.

Select positions across several agencies require CESCL training. This training is available in-house (Ecology-approved) or through qualified vendors.

SWSS conducts an ongoing review of County programs to identify activities and positions whose operations and maintenance activities could impact stormwater quality. Training records are currently managed by each agency. These trainings are hosted and tracked on a SharePoint based Stormwater Classroom webpage along with a library of records on individuals who have taken those trainings.

- g. *Implement a SWPPP for all heavy equipment maintenance or storage yards, and material storage facilities owned or operated by the Permittee in areas subject to this permit that are not required to have coverage under the General NPDES Permit for Stormwater Discharges Associated with Industrial Activities or another NPDES permit that authorizes stormwater discharges associated with the activity. A schedule for implementation of structural BMPs shall be included in the SWPPP. Generic SWPPPs that can be applied at multiple sites may be used to comply with this requirement. The SWPPP shall include periodic visual observation of discharges from the facility to evaluate the effectiveness of BMPs.*

Under the previous permits, King County reviewed an inventory of all known County-owned properties subject to this permit condition. Properties that had existing SWPPPs continued to implement them. New SWPPPs were developed and implemented for properties that did not already have SWPPPs. All SWPPP-covered properties continue to implement appropriate BMPs under the Permit.

As King County acquires or becomes aware of additional properties subject to this Permit condition, new SWPPPs will be developed and implemented.

h. Maintain records of inspections and maintenance or repair activities conducted by the Permittee.

Stormwater-related inspection and maintenance programs exist in several King County agencies, each with their own record-keeping systems. All agencies conducting inspections or maintenance activities germane to the Permit track those actions and maintain those records for a period of no less than five years.

Attachment 2017 Annual Report Question #55:

If using a reduced inspection frequency on stormwater treatment and flow control BMPs/facilities regulated by the Permittee for the first time during this permit cycle, attach documentation per S5.C.9.b.ii.

As appropriate, spills and other select Incidents are reported to Ecology's Environmental Report Tracking System database.

In 2018 King County plans to make a concerted effort to ensure awareness and coordination among King County agencies around proper response, tracking, and reporting of spills and improper disposal into King County's MS4.

2.1.9 Operations and Maintenance Program – S5.C.9

Each Permittee shall implement a program to regulate maintenance activities and to conduct maintenance activities by the Permittee to prevent or reduce stormwater impacts.

Minimum performance measures:

- a. Maintenance Standards. Each Permittee shall implement maintenance standards that are as protective, or more protective, of facility function than those specified in Chapter 4 of Volume V of the Stormwater Management Manual for Western Washington. For facilities which do not have maintenance standards, the Permittee shall develop a maintenance standard. No later than June 30, 2015 each Permittee shall update their maintenance standards as necessary to meet the requirements in this section.*
 - i. The purpose of the maintenance standard is to determine if maintenance is required. The maintenance standard is not a measure of the facility's required condition at all times between inspections. Exceeding the maintenance standard between inspections and/or maintenance is not a permit violation.*
 - ii. Unless there are circumstances beyond the Permittee's control, when an inspection identifies an exceedance of the maintenance standard, maintenance shall be performed:*
 - (1) Within 1 year for typical maintenance of facilities, except catch basins.*
 - (2) Within 6 months for catch basins.*
 - (3) Within 2 years for maintenance that requires capital construction of less than \$25,000.*

Circumstances beyond the Permittee's control include denial or delay of access by property owners, denial or delay of necessary permit approvals, and unexpected reallocations of maintenance staff to perform emergency work. For each exceedance of the required timeframe, the Permittee shall document the circumstances and how they were beyond the Permittee's control.

The 2016 SWDM sets forth the maintenance standards for stormwater facilities in King County per KCC 9.04. King County published its first SWDM in 1990 and revisions and updates have occurred since then as new facility features are developed or standards change. To comply with S5.C.9.a, King County updated the SWDM and related codes to include maintenance standards for LID BMPs, effective as of April 24, 2016.

Maintenance of stormwater treatment and flow control BMPs/facilities (facilities) is typically initiated by one of the following inspections:

- Inspections of facilities regulated by King County are conducted according to the description under S5.C.9.b, below.
- Inspections of facilities owned or operated by King County are conducted according to the description under S5.C.9.c, below.
- Privately owned facilities are inspected every other year by King County. In alternating years, King County requires facility owners to conduct self-certified inspections.

When any of the inspections referenced above identify an exceedance of a function-critical maintenance standard requiring typical maintenance, that maintenance is conducted within the one year timeline allowed by the Permit. If the maintenance is more substantial and requires capital funds, up to \$25,000, the facility is added to the Facility Remediation Program and the maintenance is completed within the two-year timeline allowed by the Permit.

Catch basins owned or operated by King County are inspected according to the description under S5.C.9.d, below. When a catch basin inspection identifies an exceedance of a function-critical maintenance standard, (i.e. one that has the potential to negatively impact water quality), that maintenance is conducted within the six-month timeline allowed by the Permit.

As development and redevelopment projects add increasing numbers of LID BMPs to the County's stormwater infrastructure inventory, King County will be responsible for inspecting and/or maintaining more and more non-traditional stormwater controls. LID is relatively new and knowledge of effective maintenance practices is limited, which means that the County will have to adaptively manage its approach to inspection and maintenance of LID BMPs. This will likely require development of new maintenance techniques, potentially with new types of equipment, and training of County personnel involved in this body of work.

b. Maintenance of stormwater facilities regulated by the Permittee:

i. Each Permittee shall evaluate and, if necessary, update existing ordinances or other enforceable documents requiring maintenance of all permanent stormwater treatment and flow control BMPs/facilities regulated by the Permittee (including catch basins that are part of the facilities regulated by the Permittee), in accordance with maintenance standards established under S5.C.9.a., above.

ii. Each Permittee shall implement an on-going inspection program to annually inspect all stormwater treatment and flow control BMPs/facilities regulated by the Permittee to enforce compliance with adopted maintenance standards as needed based on inspection. The inspection program is limited to facilities to which the Permittee can legally gain access, provided the Permittee shall seek access to all stormwater treatment and flow control BMPs/facilities regulated by the permittee.

Permittees may reduce the inspection frequency based on maintenance records of double the length of time of the proposed inspection frequency. In the absence of maintenance records, the Permittee may substitute written statements to document a specific less frequent inspection schedule. Written statements shall be based on actual inspection and maintenance experience and shall be certified in accordance with G19 Certification and Signature.

iii. Each Permittee shall manage maintenance activities to inspect all permanent stormwater treatment and flow control BMPs/facilities, and catch basins, in new residential developments every six months, until 90% of the lots are constructed (or when construction has stopped and the site is fully stabilized), to identify maintenance needs and enforce compliance with maintenance standards as needed.

iv. Compliance with the inspection requirements of S5.C.9.b.ii and iii, above, shall be determined by the presence of an established inspection program designed to inspect all sites, and achieving inspection of 80% of all sites.

v. The Permittee shall require cleaning of catch basins regulated by the Permittee if they are found to be out of compliance with established maintenance standards in the course of inspections conducted at facilities under the requirements of S5.C.7. Source Control Program for Existing Development, and S5.C.8. Illicit Connections and Illicit Discharges Detection and Elimination, or if the catch basins are part of the stormwater facilities inspected under the requirements of S5.C.9. Operation and Maintenance Program.

The following KCCs authorize King County personnel to inspect and require maintenance of stormwater facilities.

- KCC 9.04.050 states that “Maintenance of all drainage facilities in compliance with King County maintenance standards is the responsibility of the applicant or property owner as described in the Surface Water Design Manual, except those facilities for which King County assumes maintenance and operation as described in K.C.C 9.04.115 and 9.04.120 and the Surface Water Design Manual”.
- KCC 9.12.140 gives the director authorization to “make such inspections and take all actions that may be required to enforce this chapter”.

Additionally, developers are required to record easements and covenants providing the County with right-of-entry and inspection of private drainage and stormwater control systems.

Private facilities regulated by King County are inspected per Permit requirements. Inspections are generally conducted between July and October.

In any given year, half of the private commercial facility inventory is visited by an inspector to confirm full compliance based on the maintenance standards in the SWDM. If any deficiencies are discovered, a Maintenance Correction Letter is sent, giving the property owner sufficient time to correct the problem before the end of the year. The property owner notifies SWSS when the work has been completed. Extensions may be granted if circumstances warrant and permit timelines can accommodate the extension. Progressive enforcement may be used when maintenance is not completed within the timelines specified by the County.

The other half of the private commercial facilities regulated by King County complete a self-certified inspection in which they confirm full functionality of all facilities on their property.

For those properties with a history of consistent compliance, the inspection frequency may be reduced based on maintenance records.

All compliance activities are tracked using a proprietary Maintenance Information System (MIS). At the end of the year, SWSS provides a SWM Fee discount report to the WLRD SWM Fee billing supervisor who then gives the report to the King County Department of Assessments. Property owners in compliance receive a SWM fee discount.

c. *Maintenance of stormwater facilities owned or operated by the Permittee*

- i. *Each Permittee shall implement a program to annually inspect all permanent stormwater treatment and flow control BMPs/facilities owned or operated by the Permittee. Permittees shall implement appropriate maintenance action(s) in accordance with adopted maintenance standards.*

Permittees may reduce the inspection frequency based on maintenance records of double the length of time of the proposed inspection frequency. In the absence of maintenance records, the Permittee may substitute written statements to document a specific less frequent inspection schedule. Written statements shall be based on actual inspection and maintenance experience and shall be certified in accordance with G19 Certification and Signature.

- ii. *Each Permittee shall implement a program to conduct spot checks of potentially damaged permanent stormwater treatment and flow control BMPs/facilities after major storm events (24 hour storm event with a 10 year or greater recurrence interval). If spot checks indicate widespread damage/maintenance needs, inspect all stormwater treatment and flow control BMPs/facilities that may be affected. Conduct repairs or take appropriate maintenance action in accordance with maintenance standards established under S5.C.9.a., above, based on the results of the inspections.*

- iii. *Compliance with the inspection requirements of S5.C.9.c.i., and ii. above, shall be determined by the presence of an established inspection program designed to inspect all sites and achieving at least 95% of required inspections.*

King County owned or operated facilities fall into two general categories: residential facilities serving subdivisions and facilities associated with County properties.

SWSS is responsible for inspecting and maintaining approximately 1,100 residential facilities in unincorporated King County and cities with which the County contracts. As with private facilities, residential facilities with consistent compliance may be eligible for a phased inspection schedule.

SWSS uses Roads crews and vendor contractors to perform facility maintenance. Field inspection data for these facilities are entered into MIS by the inspector, resulting in a work authorization in MIS from which the Roads crew supervisor accesses and assigns the work to be completed within the permit allotted time.

Inspectors also identify noxious weed removal needs and capital repairs or corrections, if needed. Additionally, citizen complaints may warrant a site inspection to identify corrections. The maximum duration between inspections is three years, but problem sites may require annual inspections and maintenance.

Inspection and maintenance of facilities associated with King County properties are the responsibility of the custodial agency. Custodial facility inspections are conducted by SWSS or the custodial agency and range in frequency from several times per year to once annually.

Spot inspections conducted after large rain events are performed by the respective custodial agencies and focus on the areas of greatest rainfall intensity based on rain gauge data.

We target 100 percent of the facilities owned or operated by King County and at least 95 percent of required inspections are completed annually.

d. Maintenance of Catch Basins Owned or Operated by the Permittee

- i. Each Permittee shall annually inspect catch basins and inlets owned or operated by the Permittee, or implement alternatives below.*

Alternatives to the standard approach of inspecting catch basins annually: Permittees may apply the following alternatives to all or portions of their system.

- (1) The annual catch basin inspection schedule may be changed as appropriate to meet the maintenance standards based on maintenance records of double the length of time of the proposed inspection frequency. In the absence of maintenance records for catch basins, the Permittee may substitute written statements to document a specific, less frequent inspection schedule. Written statements shall be based on actual inspection and maintenance experience and shall be certified in accordance with G19 Certification and Signature.*
- (2) Annual inspections may be conducted on a “circuit basis” whereby 25% of catch basins and inlets within each circuit are inspected to identify maintenance needs. Include an inspection of the catch basin immediately upstream of any system outfall or discharge point, if applicable. Clean all catch basins within a given circuit for which the inspection indicates cleaning is needed to comply with maintenance standards established under S5.C.9.a., above.*
- (3) The Permittee may clean all pipes, ditches, catch basins, and inlets within a circuit once during the permit term. Circuits selected for this alternative must drain to a single point.*

- ii. The disposal of decant water shall be in accordance with the requirements in Appendix 6 – Street Waste Disposal.*

- iii. Compliance with the inspection requirements of S5.C.9.d.i. above, shall be determined by the presence of an established inspection program designed to inspect all catch basins and achieving at least 95% of required inspections.*

Each custodial agency within King County is responsible for the inspection and maintenance of their respective properties and associated stormwater assets.

Of the custodial agencies, Roads carries the largest catch basin inventory. Roads implements a circuit-based inspection and maintenance program for catch basins and inlets in the road ROW. The circuit approach focuses on the inspection of a subset of catch basins in each drainage circuit to determine where to focus maintenance activities. The program includes annual staff training, completion of inspection checklists, data input into a geospatial database, data quality assurance/quality control,

work order generation, requisite maintenance, and documentation of maintenance activities.

SWD, WTD, Parks, and FMD each have a relatively small number of catch basins (typically less than 500) in their facility inventory. These agencies inspect 100 percent of their catch basin inventory at least annually, with a very limited number on a modified schedule, and conduct maintenance on those that fail to meet the maintenance standards found in the SWDM. WTD addresses catch basins that accumulate sediment infrequently on a rotational inspection and maintenance basis, while those needing regular maintenance are inspected annually.

To address maintenance challenges related to operating an airport, KCIA uses an alternative approach due to several airport operation challenges, which is in accordance with S5.C.9.d.i. (3). KCIA performs enhanced daily mechanical sweeping of paved areas. It has established east, west, and central catch basin cleaning activity circuits and cleans all pipes, ditches, catch basins, and inlets in each circuit once during the permit term. The alternative cleaning schedule repeats every three years. Each circuit drains to a single point. Results of annual stormwater facility inspections, annual IC/IDDE inspections, and daily pavement sweeping show that this frequency is optimal. The east circuit was cleaned in November 2015 and the central in June 2016. The west circuit was cleaned in 2017. For the 2015-17 cleaning cycle, line cleaning and video inspection were also performed.

Oil water separators at the KCIA are maintained weekly. Catch basins are also cleaned on an as-needed basis in accordance with the Airport's Spill Response Policy and the occurrence of construction activities. The KCIA tenants are required to clean their catch basins and sweep as well.

KCIA performs these activities in compliance with its Industrial Stormwater General Permit (ISGP) requirements. ISGP SWPPP requirements include monthly facility inspections, quarterly stormwater discharge monitoring and reporting, corrective actions, training, and annual reporting.

Roads operates a regional stormwater decant station in Renton and temporary decant stations at three other maintenance facilities run by Roads. Transit operates its own decant station at one of its Tukwila properties. These decant stations are a key element in the disposal of stormwater removed from the County's MS4 during catch basin cleaning activities. All stormwater accepted at these decant stations is disposed of through the sanitary sewer.

All maintenance needs identified through inspections are addressed within the timelines established in S5.C.9.a.ii.

- e. Each Permittee shall implement practices, policies, and procedures to reduce stormwater impacts associated with runoff from all lands owned or maintained by the Permittee, and road maintenance activities under the functional control of the Permittee. Lands owned or maintained by the Permittee include, but are not limited to: parking lots, streets, roads, highways, buildings, parks, open space, road ROW, maintenance yards, and stormwater treatment and flow control BMPs/facilities.*

The following activities shall be addressed:

- i. Pipe cleaning*
- ii. Cleaning of culverts that convey stormwater in ditch systems*
- iii. Ditch maintenance*
- iv. Street cleaning*
- v. Road repair and resurfacing, including pavement grinding*
- vi. Snow and ice control*
- vii. Utility installation*
- viii. Maintaining roadside areas, including vegetation management*
- ix. Dust control*
- x. Pavement striping maintenance*
- xi. Application of fertilizers, pesticides, and herbicides according to the instructions for their use, including reducing nutrients and pesticides using alternatives that minimize environmental impacts*
- xii. Sediment and erosion control*
- xiii. Landscape maintenance and vegetation disposal*
- xiv. Trash and pet waste management*
- xv. Building exterior cleaning and maintenance*

The County has several programs that establish practices for reducing stormwater impacts associated with runoff from parking lots, streets, roads, and highways owned, maintained, or operated by the County. Custodial agencies are responsible for developing an inventory of their properties, and developing and implementing an inspection and maintenance program. The inspection programs for most custodial agencies are based on a tiered program using metrics such as the presence of structures, potential pollution generating activities, public access, property size, and proximity of water bodies to prioritize the risk of pollution impacts for each site. These Inspection frequencies range from single to multiyear depending on the level of risk.

In 2009, SWSS produced a draft document that consolidated the operations and maintenance BMPs from numerous King County program documents. These BMPs are designed to reduce stormwater impacts associated with the operations and maintenance activities referred to in S5.C.9.e. Called the SiMPla (Site Management Plan), it has been issued to the County's custodial agencies to be used as the minimum standard for operations and maintenance of properties owned or maintained by King County. In 2012, an updated, revised, and reformatted version of the SiMPla was completed and distributed not only within King County but amongst other Phase I and Phase II municipalities in the region for their use/reference. In addition, a dedicated SiMPla website was developed at

<http://www.kingcounty.gov/environment/waterandland/stormwater/documents/site-management-plan.aspx> to allow for easy navigation and access to the document and its contents. The 2012 document includes sections of the following:

- the Regional Road Maintenance ESA Program Guidelines,
- the draft Maintenance Performance Standards (King County Department of Transportation, 2008),
- Draft Stormwater Management Manual for Western Washington (Ecology, 2011)
- the SPPM (DNRP, 2009), and
- the Integrated Pest Management Program guidelines (Department of Executive Services, 2012).

Several agencies have internal manuals and programs that are as, or more, protective of stormwater quality as the baseline requirements found in the SiMPla and are used by those agencies as equivalent programs. Additionally, King County properties under NPDES industrial stormwater permits have SWPPPs, which are used instead of the SiMPla.

f. Implement an ongoing training program for employees of the Permittee who have primary construction, operations or maintenance job functions that may impact stormwater quality. The training program shall address the importance of protecting water quality, operation and maintenance standards, inspection procedures, selecting appropriate BMPs, ways to perform their job activities to prevent or minimize impacts to water quality, and procedures for reporting water quality concerns. Follow-up training shall be provided as needed to address changes in procedures, techniques, requirements, or staffing. Permittees shall document and maintain records of the training provided and the staff trained.

King County offers a number of training programs within various agencies for personnel in positions that have construction, or operations and maintenance job functions that could impact stormwater quality.

King County Roads has conducted annual in-house training of all their field staff and appropriate support staff since 2002. The training is tailored specifically for the operations and maintenance staff at Roads and addresses, among other subjects, stormwater pollution prevention, spill response, and aquifer protection. In addition, Roads field crews participate in the Regional Road Maintenance ESA Program training

series (Track 1, 2 & 3). This training focuses on BMP practices and uses, maintenance guidelines, design criteria, and habitat requirements.

FMD has established a training program that focuses on general stormwater awareness, IC/IDDE and basic spill response for all the trades and janitorial staff. Trades that perform operations and maintenance work on building exteriors and grounds also receive training on the use of the SiMPla.

Select positions across several agencies require CESCL training. This training is available in-house (Ecology-approved) or through qualified vendors.

SWSS conducts an ongoing review of County programs to identify activities and positions whose operations and maintenance activities could impact stormwater quality. Training records are currently managed by each agency. These trainings are hosted and tracked on a SharePoint based Stormwater Classroom webpage along with a library of records on individuals who have taken those trainings.

- g. *Implement a SWPPP for all heavy equipment maintenance or storage yards, and material storage facilities owned or operated by the Permittee in areas subject to this permit that are not required to have coverage under the General NPDES Permit for Stormwater Discharges Associated with Industrial Activities or another NPDES permit that authorizes stormwater discharges associated with the activity. A schedule for implementation of structural BMPs shall be included in the SWPPP. Generic SWPPPs that can be applied at multiple sites may be used to comply with this requirement. The SWPPP shall include periodic visual observation of discharges from the facility to evaluate the effectiveness of BMPs.*

Under the previous permits, King County reviewed an inventory of all known County-owned properties subject to this permit condition. Properties that had existing SWPPPs continued to implement them. New SWPPPs were developed and implemented for properties that did not already have SWPPPs. All SWPPP-covered properties continue to implement appropriate BMPs under the Permit.

As King County acquires or becomes aware of additional properties subject to this Permit condition, new SWPPPs will be developed and implemented.

h. Maintain records of inspections and maintenance or repair activities conducted by the Permittee.

Stormwater-related inspection and maintenance programs exist in several King County agencies, each with their own record-keeping systems. All agencies conducting inspections or maintenance activities germane to the Permit track those actions and maintain those records for a period of no less than five years.

Attachment 2017 Annual Report Question #48:

Attach a summary of actions taken to characterize, trace and eliminate each illicit discharge found by or reported to the permittee. For each illicit discharge, include a description of actions according to required timelines per S5.C.8.d.iv.

Type	File #	Business	Address	Parcel #	Disposition
WQC	2017-0062	Fairwood Contractor Discharge	16554 162ND PL se	2473470140	Contractor washed concrete residue on to driveway, washing down to conveyance system. Education provided and material was removed.
WQC	2017-0063	Vashon Trash and Trailers	11103 SW 212TH PL	0722039096	Complaint about trash and trailers. Unable to verify as property posted no trespassing and no one answered. No signs of discharge
WQC	2017-0064	Rimwood Pond Odor	5130 243rd Ave NE	7322900420	Odor from drainage pond was determined to be from natural causes and not sewage related.
WQC	2017-0249	Wear Trucking Disposal Complaint	5017 S 347th Pl	6064600343	Unfounded complaint about chemical dumping.
WQC	2017-0319	White Center Hose	10256 6th Ave SW	7973202225	Strange hose determined to be from homeowner piping his roof runoff from downspout.
WQC	2017-0414	Cedar Falls Engine Repair	17007 Cedar Falls Rd SE	2623089058	Cars and parts stored on King County Solid Waste property. Referred back to Solid Waste for impoundment.
WQC	2017-0415	Cedar Falls Septic Discharge	16956 431st Ave SE	9407110130	Discharge thought to be septage. Sample results were negative
WQC	2017-0508	North Highline Fire District	1243 SW 112TH ST	0723049107	Fire station had illicit connection from interior mop sink and drinking fountain to stormwater conveyance. Connection removed.
WQC	2017-0565	Burton High Bacteria	24115 99TH AVE SW	1922039078	Possible septic discharge. Referred to Public Health for follow-up
WQC	2017-0567	Maple Valley Construction Discharge	18215 RENTON MAPLE VALLEY RD SE	1469400100	Runoff from unpermitted construction. Problem corrected
WQC	2017-0570	Renton Highlands Cross Culvert Oil Sheen	169XX SE 142ND ST	7229800125	Oily sheen on culvert walls seen one time and then never again.
WQC	2017-0573	Horse Confinement Discharge	1432x 200th Ave SE	1723069119	Water from pasture can discharge on to neighboring problem. No stormwater contamination.
WQC	2017-0574	Starman Metal Fabrications Discharge	17300 SE 132nd St	1323059142	Grit removed and business relocated.
WQC	2017-0581	White Center CB Illicit Discharge	98XX 17th Ave SW	3004800430	Unknown source of material in CB. Vactored out and CB repaired.
WQC	2017-0583	Lee Construction Problems	10013 20th Ave SW	7211400220	Education provided.
WQC	2017-0584	White Center Residential Auto Repair	10021 20th Ave Sw	7211400045	No problem found.
WQC	2017-0621	May Valley Culvert Litter	10217 148TH AVE SE	5230000020	No problem found.
WQC	2017-0622	Burien ditch discharge	118 S 108TH PL	0795000230	No problem found.
WQC	2017-0634	Hwy 202 Discharge	23040 NE Redmond Fall City Rd	2225069023	Sewer line air release valve malfunctioned. Immediately repaired by sewer district.
WQC	2017-0644	LT Famous BBQ & Car Wash	12914 Martin Luther King Jr. Way S	2172000596	Education provided with instructions to cease car washing.
WQC	2017-0645	Otter Lake Catch Basin Concern	19322 SE 178th Pl	7937600551	Referred to Public Health to deal with failing septic system.
WQC	2017-0650	Truck Performance Northwest Diesel Leak	18417 Renton Maple Valley Hwy SE	3223069104	Leaking equipment discovered and repaired.
WQC	2017-0651	Suspect May Creek Discharge	11817 164th Ave SE	0638100300	No problem found.
WQC	2017-0652	East Highlands Dirty Ditch	16402 SE 128th St	1223059072	Conducted BMP inspections at nearby businesses for pollution prevention.
WQC	2017-0658	Woodinville Water District Discharge	16404 173rd Ave NE	1326059154	One sluggish frog does not indicate an environmental disaster.
WQC	2017-0666	Issaquah yard waste dumping	26450 152nd ST SE	2423069047	No stormwater problem found.
WQC	2017-0670	Deep Creek Discoloration	33104 SE 126th St	1023079048	Unable to verify or find source.
WQC	2017-0681	Fairwood Pond Discoloration	16902 SE Fairwood Blvd	2473461190	No stormwater problem found.
WQC	2017-0694	Modern Carport & Fence	430 S 96th St	3224049071	Education provided
WQC	2017-0698	Seattle's Espresso Restore LLC	430 S 96th St #12	3224049071	Education provided
WQC	2017-0699	McWiggins Residence RV discharge	25722 SE 200th St	0222069100	Could not provide RV discharge. Assistance provided in removing junk and debris.
WQC	2017-0700	Lowe Residence RV discharge	20061 258th Ave SE	0222069020	No problem found.
WQC	2017-0701	Federal Way Illicit Discharge	28906 44th Ave S	3682000080	No stormwater problem found.
WQC	2017-0704	Cascade Jr. High School	11212 10th Ave SW	0723049367	CBs cleaned
WQC	2017-0705	Sat Guru Ram Singh Satsangh Illicit Connection	4500 S 360th St	3750600012	Sewer line being repaired
WQC	2017-0711	White Center Safeway	9620 28th Ave SW	2853600005	Leaking compactor replaced
WQC	2017-0717	Des Moines Drive Discharge	9909 Des Moines Memorial Dr S	5624200454	Testing negative. No problem found
WQC	2017-0718	Suds in pond D93067	235XX NE Twinberry Way	8682292380	Likely natural sources - rain after dry period
WQC	2017-0719	Auburn Illicit Discharge	4437 S 348 Pl	4031100160	Quartz dust from homeremodel. Education provided with instructions to vacuum up remaining dust.
WQC	2017-0727	Milton CB Discharge		1874001560	No problem found.
WQC	2017-0731	Peil Illicit Connection	11007 7th Pl S	0523049135	Leaking old oil tank. Homeowner to remove tank.
WQC	2017-0749	Concrete Slurry Moton Residence	7921 S 115th St	9282801370	Material removed and education provided.
WQC	2017-0752	Acme Fire Equipment	16215 135th Ave SE	2473250280	No problem found.
WQC	2017-0762	Kent Paint Dumping	28713 207th Ave SE	1796250060	Education provided.
WQC	2017-0763	Bessmer Mine Fuel Spill		2624099008	State DNR addressing problem on this remote mine site.
WQC	2017-0765	Alpine Mobile Manor	31515 SE 97th St	3324079048	OSS repair problems.
WQC	2017-0767	Fairwood Golf Maintenance Area	17124 151st Ave SE	2473372850	Working on alternative measures.
WQC	2017-0769	Soushek Construction Problems	29517 176th Ave SE	0121059017	Working with property owner.
WQC	2017-0803	Cedar Grove Rd Facility	17966 Cedar Grove Rd SE	3223069084	Source recently identified and under correction.
WQC	2017-0819	Mirrormont Septic Seep	15316 Issaquah Hobart Rd SE	2323069020	Public health still trying to identify source.
WQC	2017-0820	Trilogy HOA Landscape Maintenance	23120 NE 123rd St	0682211190	Education provided.
WQC	2017-0840	Magic Creek Rescue	39507 208th Ave SE	0520069015	No problem found.
WQA L	2017-0841	QualFab	1705 S 93rd St	0001600050	Discharge ceased. Cleaned system and changed practices
WQC	2017-0848	Integrity Energy Systems	420 S 96th St	3224049071	Education provided. Told to cease washing vehicles outside.
WQC	2017-0863	Bogar Illicit Sewage Connection	24523 SE 469th St	8876000065	Confirmed and awaiting repair.
WQC	2017-0864	Christiansen Property	11575 208th Pl SE	0823069041	No problem found.
WQC	2017-0865	Liberty HS Stormwater Connections	16655 SE 136th St	1323059038	No problem found.
WQC	2017-0868	Leaking Garbage Truck	153xx SE 183rd St	1402001190	Informed hauler of problem and requested repair.
WQC	2017-0880	Maple Valley Possible Septic Problem	22005 SE Bain Rd	0922069124	No problem found.
WQC	2017-0883	White Center Pond Oil Spill	10254 7th Ave SW	7973202115	No source found. Monitoring.
WQC	2017-0888	Maple Valley RV over Creek	21208 Maxwell Rd SE	0922069001	RV removed.
WQC	2017-0904	Maple Valley D99133 Pond Sheen	22050 SE 220th St	0922069110	No problem found.
WQC	2017-0911	Reinig Rd Mobile Home Discharge	4060 SE Reinig Rd	2824089011	Awaiting coordination with Muckleshoot Tribe
WQC	2017-0913	Glendale Concrete Washdown	10220 9th Ave S	2788400306	Education provided.
WQC	2017-0918	White Center South Westor Apartments Soil Contamination	11060 4th Ave SW	0623049350	No problem found.
WQC	2017-0923	Federal Way Fire discharge	30208 41st Ave S	1312910360	Material removed as much as possible.
WQC	2017-0926	Standley's Machinery Repair	23217 212th Ave SE	1722069095	Abandoned home occupation auto repair. Attempting to located property owners. Coordinating with Local Hazardous Waste.

Attachment 2017 Annual Report Question #40b:

Cite field methodology used in the Comments field.

2.1.8 Illicit Connections and Illicit Discharges Detection and Elimination – S5.C.8

The SWMP shall include an ongoing program designed to prevent, detect, characterize, trace, and eliminate illicit connections and illicit discharges into the MS4.

Minimum performance measures:

- a. *The program shall include procedures for reporting and correcting or removing illicit connections, spills and other illicit discharges when they are suspected or identified. The program shall also include procedures for addressing pollutants entering the MS4 from an interconnected, adjoining MS4.*

Illicit connections and illicit discharges shall be identified through field screening, inspections, complaints/reports, construction inspections, maintenance inspections, source control inspections, and/or monitoring information, as appropriate.

King County achieves compliance with S5.C.8 through implementation of the programs described in this section (pages 45-52).

- b. No later than February 2, 2018, each Permittee shall evaluate and, if necessary, update existing ordinances or other regulatory mechanisms to effectively prohibit non-stormwater, illicit discharges, including spills, into the Permittee's MS4.
- i. Allowable Discharges: The ordinance or other regulatory mechanism does not need to prohibit the following categories of non-stormwater discharges:
- (1) Diverted stream flows
 - (2) Rising ground waters
 - (3) Uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(b)(20))
 - (4) Uncontaminated pumped ground water
 - (5) Foundation drains
 - (6) Air conditioning condensation
 - (7) Irrigation water from agricultural sources that is commingled with urban stormwater
 - (8) Springs
 - (9) Uncontaminated water from crawl space pumps
 - (10) Footing drains
 - (11) Flows from riparian habitats and wetlands
 - (12) Non-stormwater discharges authorized by another NPDES or State Waste Discharge permit
 - (13) Discharges from emergency firefighting activities in accordance with S2 Authorized Discharges
- ii. Conditionally Allowable Discharges: The ordinance or other regulatory mechanism, may allow the following categories of non-stormwater discharges only if the stated conditions are met:
- (1) Discharges from potable water sources including, but not limited to, water line flushing, hyperchlorinated water line flushing, fire hydrant system flushing, and pipeline hydrostatic test water. Planned discharges shall be dechlorinated to a total residual chlorine concentration of 0.1 ppm or less, pH-adjusted if necessary, and volumetrically and velocity controlled to prevent resuspension of sediments in the MS4.
 - (2) Discharges from lawn watering and other irrigation runoff. These discharges shall be minimized through, at a minimum, public education activities (see S5.C.10.) and water conservation efforts.

- (3) *Dechlorinated swimming pool, spa, and hot tub discharges. The discharges shall be dechlorinated to a total residual chlorine concentration of 0.1 ppm or less, pH-adjusted and reoxygenated if necessary, and volumetrically and velocity controlled to prevent resuspension of sediments in the MS4. Discharges shall be thermally controlled to prevent an increase in temperature of the receiving water. Swimming pool cleaning wastewater and filter backwash shall not be discharged to the MS4.*
- (4) *Street and sidewalk wash water, water used to control dust, and routine external building washdown that does not use detergents. The Permittee shall reduce these discharges through, at a minimum, public education activities (see S5.C.10.) and/or water conservation efforts. To avoid washing pollutants into the MS4, Permittees shall minimize the amount of street wash and dust control water used.*
- (5) *Other non-stormwater discharges shall be in compliance with the requirements of a pollution prevention plan reviewed by the Permittee which addresses control of such discharges.*
- iii. *The Permittee shall further address any category of discharges in S5.C.8.b.i or ii above if the discharges are identified as significant sources of pollutants to waters of the State.*

KCC 9.12 authorizes the allowable discharges and conditionally allowable discharges but requires the application of BMPs specified in the SPPM at any property discharging hyperchlorinated line flushing, swimming pool water, and street and sidewalk wash water. PHSKC regulates public swimming pools and complies with adopted stormwater standards outlined in the SPPM for dechlorination, pH adjustment, and velocity controls. Discharges from irrigation or lawn watering are addressed as part of the Natural Yard Care education program. Other non-stormwater discharges are also prohibited or conditionally allowed by KCC 9.12.

In 2016 an updated SPPM was adopted that clearly addresses pool, spa and hot tub discharges.

c. *Each Permittee shall implement an ongoing program designed to detect and identify non-stormwater discharges and illicit connections into the Permittee's MS4. The program shall include the following components:*

i. *Procedures for conducting investigations of the Permittees MS4, including field screening and methods for identifying potential sources. These procedures may also include source control inspections.*

The permittee shall implement a field screening methodology appropriate to the characteristics of the MS4 and water quality concerns. Screening for illicit connections may be conducted using the Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments, Center for Watershed Protection, October 2004; or another method of comparable or improved effectiveness. The Permittee shall document the field screening methodology in the relevant Annual Report.

- (1) *Each Permittee shall implement an ongoing field screening program of, on average, 12% of the Permittee's known conveyance systems each calendar year.*
- (2) *Each City shall field screen all the conveyance systems within the Permittee's incorporated area at least once between February 2007 and July 31, 2018.*
- (3) *Each County shall field screen all the conveyance systems within the Permittee's urban/higher density rural sub-basins at least once between February 2007 and July 31, 2018.*

King County addresses this MS4 field screening requirement through the implementation of two departmental programs. These programs are:

SWSS CSP:

SWSS will conduct a Conveyance Screening Program (CSP) in 2018 to check known stormwater outfalls and other system connections for dry weather flow and other evidence of non-permitted substances, using these as indicators of possible illicit discharge. At least 12 percent of known, mapped locations where stormwater leaves the County's MS4 will be inspected for evidence of illicit connections/illicit discharges (IC/ID) under the CSP program. MS4 locations identified for further investigation will trigger follow-up *in situ* field screening to further assess the likelihood of IC/ID. If warranted, laboratory analytical samples will be collected; sampling and analysis depends on both the follow-up screening results and on nearby observed land uses (e.g., potential pollution sources, including failing septic systems, illicit sewer connections, commercial/industrial sites or other possible pollutant sources).

In 2018, the CSP will focus on urban and higher density areas throughout King County. It will also focus throughout the Bear/Evans Creek and Issaquah Creek drainage basins.

Roads CBIMP:

Roads will conduct its annual Catch Basin Inspection and Maintenance Program (CBIMP). Roads plans to inspect 100 percent of known, mapped catch basin circuits on an annual basis, including inspecting a minimum of 25 percent of the catch basins within each circuit. It is anticipated that a minimum of 30 percent of known, mapped, Roads-owned catch basins County-wide will be inspected annually during CBIMP tasks. While implementing CBIMP, Roads staff will actively look for evidence of IC/ID and will record whether or not such evidence is observed. Catch basins identified for further investigation will trigger follow-up *in situ* field screening to further assess the likelihood of IC/ID.

County personnel involved in the SWSS CSP and Roads' CBIMP have received and, as needed, will continue to receive comparable training to ensure consistency across the program elements.

- ii. A publicly-listed and publicized hotline or other telephone number for public reporting of spills and other illicit discharges.*

Citizen reports are received by the County in a number of ways.

- Roads 24-hour hotline at 477-8100 or 800-KCROADS
- SWSS Water Quality hotline at 206-477-4811
- Illegal Dumping Hotline 206-296-SITE or 866-431-7483
- DPER inspector contact information posted on signage at each development/redevelopment project site in unincorporated King County that is permitted by DPER
- Illegal Dumping web form at <http://your.kingcounty.gov/solidwaste/cleanup/report-dumping.asp>
- Online report form for drainage and water quality problems at <http://www.kingcounty.gov/environment/waterandland/stormwater/problem-investigation-line/report-form.aspx>
- Direct contact between King County staff and a member of the public.
- Referrals from other King County Departments/Divisions/Agencies.

- iii. An ongoing training program for all municipal field staff, who, as part of their normal job responsibilities might come into contact with or otherwise observe an illicit discharge or illicit connection to the MS4, on the identification of an illicit discharge and/or connection, and on the proper procedures for reporting and responding to the illicit discharge and/or connection. Follow-up training shall be provided as needed to address changes in procedures, techniques, requirements, or staffing. Permittees shall document and maintain records of the training provided and staff trained.*

Each King County agency with field personnel subject to this requirement is responsible for training those employees to identify an illicit discharge or connection, and to properly report and respond. The County continues to review its programs and identify additional

personnel that need this training. The County also continues to assess the need for follow-up training as regulations, procedures, or personnel change. Permit related trainings are centralized and coordinated using a web based stormwater classroom.

Training records are currently managed by each agency. These records are then uploaded to the stormwater classroom to ensure appropriate staff members are trained.

- d. Each Permittee shall implement an ongoing program designed to address illicit discharges, including spills and illicit connections, into the Permittee's MS4. The program shall include:*
- i. Procedures for characterizing the nature of, and potential public or environmental threat posed by, any illicit discharges found by or reported to the Permittee. Procedures shall address the evaluation of whether the discharge must be immediately contained and steps to be taken for containment of the discharge.*
 - ii. Procedures for tracing the source of an illicit discharge; including visual inspections, and when necessary, opening manholes, using mobile cameras, collecting and analyzing water samples, and/or other detailed inspection procedures.*
 - iii. Procedures for eliminating the discharge; including notification of appropriate authorities; notification of the property owner; technical assistance; follow-up inspections; and escalating enforcement and legal actions if the discharge is not eliminated.*
 - iv. Compliance with the provisions in S5.C.8.d.i, ii, and iii, above, shall be achieved by meeting the following timelines:*
 - (1) Immediately respond to all illicit discharges, including spills, which are determined to constitute a threat to human health, welfare, or the environment consistent with General Condition G3.*
 - (2) Investigate (or refer to the appropriate agency with authority to act) within 7 days, on average, any complaints, reports or monitoring information that indicates a potential illicit discharge.*
 - (3) Initiate an investigation within 21 days of any report or discovery of a suspected illicit connection to determine the source of the connection, the nature and volume of discharge through the connection, and the party responsible for the connection.*
 - (4) Upon confirmation of an illicit connection, use enforcement authority in a documented effort to eliminate the illicit connection within 6 months. All known illicit connections to the MS4 shall be eliminated.*

The County implements a number of programs to address illicit connections and illicit discharges. These programs were created to address issues that occur on King County properties and throughout the ROW in unincorporated King County.

Generally, illicit connections are handled through SWSS, whereas, dumped waste and spilled materials are managed through the County agency responsible for the property upon which the incident occurred.

Any illicit connection identified by a County employee or through an external party (for example, citizen complaint) is reported to SWSS and an investigation is initiated. A Water Quality Engineer traces the source to identify the responsible party and uses progressive enforcement to achieve the elimination of the illicit connection. Records related to the investigation are managed in the SWSS Complaint Tracker database.

When the County receives a report of an illicit discharge, including spilled or dumped materials, outside of its jurisdiction, the appropriate municipality is notified of the situation.

Reports of illicit discharges within King County's jurisdiction are routed to the appropriate agency for response. Some agencies, such as Roads and Transit, have in-house capacity and training to conduct spill response activities for most commonly-occurring spills (for example, vehicular fluids or paint). Other agencies, such as Facilities Management Division (FMD), do not possess in-house spill response capacity and rely on spill response contractors or request support from other County agencies. The County maintains multiple on-call spill response contracts to facilitate timely responses. The County has also built collaborative working relationships with various local jurisdictions as well as Ecology's Northwest Regional Office Spills Program such that the County can call upon these groups for spill response assistance if needed.

For protection of human health, property and the environment, spill incidents exceeding the County's capacity for in-house responses are always referred to a spill response contractor.

- e. Permittees shall train staff who are responsible for identification, investigation, termination, cleanup, and reporting of illicit discharges, including spills and illicit connections, to conduct these activities. Follow-up training shall be provided as needed to address changes in procedures, techniques, requirements, or staff. Permittees shall document and maintain records of the training provided and the staff trained.*

King County trains field personnel on the identification, investigation, termination, cleanup, and reporting of illicit discharges and illicit connections, as appropriate for their job duties. As the agencies most likely to have their personnel involved in spill response, Roads and Transit have developed customized hazardous waste and spill response training for personnel responding to spilled or illegally dumped materials. This training has been adapted for use by other County agencies and other local jurisdictions. The training also includes guidelines for when an outside spill response contractor should be called in.

Additionally, tenants and operators at the King County International Airport (KCIA) receive annual spill response training, including procedures for notification, response and reporting, as well as preventative measures.

The County continues to review its programs and identify additional personnel that require this training. It also continues to assess the need for follow-up training as regulations, procedures, or personnel change. Permit related trainings are centralized and coordinated using a web based stormwater classroom.

Training records are currently managed by each agency. These records are then uploaded to the stormwater classroom to ensure appropriate staff are trained.

- f. Each Permittee shall either participate in a regional emergency response program, or develop and implement procedures to investigate and respond to spills and improper disposal into the MS4 owned or operated by the Permittee.*
- g. Recordkeeping: Each Permittee shall track and maintain records of the activities conducted to meet the requirements of this section.*

The County maintains several spill response programs, as described above, under S5.C.8.d.

King County has six programs that track and maintain records of the IDDE program, including documentation of inspections, complaint/spill response, and other enforcement records. These programs are outlined below:

- 1) SWSS currently maintains tracking programs, including a complaint tracker and water quality compliance tracker that track responses, findings, and enforcement actions. In 2018 SWSS will continue an effort to centralize these and other tracking databases, and transition to Cityworks.
- 2) Roads tracks and maintains electronic and paper copies of IDDE records through Roads' Service Request system in Cityworks and various internal tracking forms maintained by the Emergency Response Unit. These include forms and records specific to the spill response program, catch basin inspection records, and drainage evaluation records.
- 3) The Illegal Dumping Hotline's application operated by Solid Waste Division (SWD) records and tracks reported citizen complaints.
- 4) Transit's Environmental Compliance Office maintains electronic spreadsheets detailing fleet-related spills, conveyance system IDDE inspections, and employee training.
- 5) PHSKC maintains a proprietary database designed for public health agencies that maintains records of inspections, complaints, responses and enforcement actions.
- 6) Airport tracks and maintains spill and IC/ID records for incidents occurring at the KCIA.

Staff time and resources spent implementing these programs are tracked electronically through the County's Oracle Finance System.

As appropriate, spills and other select Incidents are reported to Ecology's Environmental Report Tracking System database.

In 2018 King County plans to make a concerted effort to ensure awareness and coordination among King County agencies around proper response, tracking, and reporting of spills and improper disposal into King County's MS4.

2.1.9 Operations and Maintenance Program – S5.C.9

Each Permittee shall implement a program to regulate maintenance activities and to conduct maintenance activities by the Permittee to prevent or reduce stormwater impacts.

Minimum performance measures:

- a. Maintenance Standards. Each Permittee shall implement maintenance standards that are as protective, or more protective, of facility function than those specified in Chapter 4 of Volume V of the Stormwater Management Manual for Western Washington. For facilities which do not have maintenance standards, the Permittee shall develop a maintenance standard. No later than June 30, 2015 each Permittee shall update their maintenance standards as necessary to meet the requirements in this section.*
 - i. The purpose of the maintenance standard is to determine if maintenance is required. The maintenance standard is not a measure of the facility's required condition at all times between inspections. Exceeding the maintenance standard between inspections and/or maintenance is not a permit violation.*
 - ii. Unless there are circumstances beyond the Permittee's control, when an inspection identifies an exceedance of the maintenance standard, maintenance shall be performed:*
 - (1) Within 1 year for typical maintenance of facilities, except catch basins.*
 - (2) Within 6 months for catch basins.*
 - (3) Within 2 years for maintenance that requires capital construction of less than \$25,000.*

Circumstances beyond the Permittee's control include denial or delay of access by property owners, denial or delay of necessary permit approvals, and unexpected reallocations of maintenance staff to perform emergency work. For each exceedance of the required timeframe, the Permittee shall document the circumstances and how they were beyond the Permittee's control.

The 2016 SWDM sets forth the maintenance standards for stormwater facilities in King County per KCC 9.04. King County published its first SWDM in 1990 and revisions and updates have occurred since then as new facility features are developed or standards change. To comply with S5.C.9.a, King County updated the SWDM and related codes to include maintenance standards for LID BMPs, effective as of April 24, 2016.

Attachment 2017 Annual Report Question #36:

Attach a summary of actions taken to implement the source control program per S5.C.7.b.iii and S5.C.7.b.iv.

Attach a summary of actions taken to implement the source control program per S5.C.7.b.iii and S5.C.7.b.iv.

S5.C.7.b.iii

In 2017, 605 source control inspections were done at commercial, industrial & multifamily sites in unincorporated King County. This represents approximately 28% of our estimated inventory of 2175 potential pollutant-generating properties. 179 of these inspections were re-inspections.

S5.C.7.b.iv

The procedures for progressive enforcement included providing a written copy of the inspection report noting what was in compliance and what else needed to be done to bring the entire site in to compliance. For more involved or complex sites with multiple compliance issues, a detailed Corrective Action Letter was sent, specifying exactly what needed to be done by when in order to come into compliance. In 2017, 21 corrective action letters were sent. 390 of the sites we inspected were in compliance at the initial inspection or only had very minor compliance issues such as needing to re-stencil a stormdrain or close a dumpster lid.

2.1.7 Source Control Program for Existing Development – S5.C.7

- a. The Permittee shall implement a program to reduce pollutants in runoff from areas that discharge to MS4s owned or operated by the Permittee. The program shall include the following:*
 - i. Application of operational and structural source control BMPs, and, if necessary, treatment BMPs/facilities to pollution generating sources associated with existing land uses and activities.*
 - ii. Inspections of pollutant generating sources at commercial and industrial properties to enforce implementation of required BMPs to control pollution discharging into MS4s owned or operated by the Permittee.*
 - iii. Application and enforcement of local ordinances at sites, identified pursuant to S5.C.7.b.ii, including sites with discharges authorized by a separate NPDES permit. Permittees that are in compliance with the terms of this permit will not be held liable by Ecology for water quality standard violations or receiving water impacts caused by industries and other Permittees covered, or which should be covered under an NPDES permit issued by Ecology.*
 - iv. Practices to reduce polluted runoff from the application of pesticides, herbicides, and fertilizer discharging into MS4s owned or operated by the Permittee.*

King County has had a stormwater source control program since 1995. Referred to as the Business Inspection Program, it identifies multifamily, commercial, and industrial sites that are potentially pollutant generating. On identified sites, the Business Inspection Program inspects structural and operational BMPs and onsite conveyance systems to ensure that the appropriate operational and structural source control BMPs are employed and properly maintained. If BMPs are lacking and/or inadequate, verbal and/or written notice is provided along with technical assistance, detailing what must be done to achieve compliance. Failure to comply may trigger progressive enforcement. The authority to issue written notices and enforce their contents is found in KCC Chapter 9.12.

The County's SPPM, various King County websites, and King County public outreach efforts all encourage the elimination or reduction of pesticides, herbicides and fertilizers.

b. Minimum performance measures:

- i. Permittees shall enforce ordinance(s), or other enforceable documents, requiring the application of source control BMPs for pollutant generating sources associated with existing land uses and activities.*

Permittees shall update and make effective the ordinance(s), or other enforceable documents, as necessary to meet the requirements of this section no later than February 2, 2018.

The requirements of this subsection are met by using the source control BMPs in Volume IV of the Stormwater Management Manual for Western Washington, or a functionally equivalent manual approved by Ecology.

Operational source control BMPs shall be required for all pollutant generating sources. Structural source control BMPs shall be required for pollutant generating sources if operational source control BMPs do not prevent illicit discharges or violations of surface water, ground water, or sediment management standards because of inadequate stormwater controls. Implementation of source control requirements may be done through education and technical assistance programs, provided that formal enforcement authority is available to the Permittee and is used as determined necessary by the Permittee, in accordance with S5.C.7.b.iv, below.

King County uses KCC Chapter 9 and the SPPM to enforce the application of source control BMPs. The County adopted the SPPM in 1995, with updates occurring in 2005, 2009, and 2016. The SPPM identifies potentially polluting activities at residential, commercial and industrial sites and the operational, structural, and/or treatment BMPs required to prevent pollutants from entering surface water, stormwater, and/or groundwater.

The Source Control enforcement program was updated 2017, and included changes to the King County Code and a Public Rule describing how penalties are calculated. Once the rule is signed in early 2018, new procedures and documentation will be developed.

- ii. Permittees shall implement a program to identify commercial and industrial properties which have the potential to generate pollutants to the Permittee's MS4. The program shall include a source control inventory which lists businesses and/or properties identified based on the presence of activities that are pollutant generating (refer to Appendix 8). The source control inventory shall also include other pollutant generating sources, such as mobile or home-based businesses and multifamily properties, which are identified based on complaint response. The Permittee shall update the inventory at least once every 5 years.*

SWSS developed an inventory of the land uses/businesses using the categories found in Appendix 8 of the Permit. King County has implemented an approach to develop the inventory list to meet this permit requirement. This approach is detailed in Appendix E.

King County uses a combination of historical inspection and complaint records,

information available through the King County Department of Assessments, map review, and field inspections to determine potential pollutant generating sites within unincorporated King County. Properties within the unincorporated area that are owned by the County and have the potential to produce pollutants are included in this inventory. The inventory is updated annually. The inventory for 2018 contains approximately 2,175 sites.

With the implementation of new software in 2018, as the inventory is entered into the system, businesses will be rated according to compliance history and potential to pollute. This rating will be used to determine inspection frequency, resulting in businesses with a higher risk and/or poor compliance history being inspected on a more frequent basis.

- iii. *Permittees shall implement an inspection program for sites identified pursuant to S5.C.7.b.ii above.*
 - (1) *All identified sites with a business address shall be provided, by mail, telephone, electronic communications, or in person, information about activities that may generate pollutants and the source control requirements applicable to those activities. This information may be provided all at one time or spread out over the permit term to allow for some tailoring and distribution of the information during site inspections.*

Direct mailing and telephoning is not an effective means of communication because there are no County records that identify the operator of a given site, their contact information, or the type of business occupying the site. Instead, information about activities that may generate pollutants and the source control requirements applicable to those activities are provided in person during a site inspection, or if no one is present, by mail. This provides the benefit of customizing the information provided to the needs of each particular site. This information is also available on King County's website at <http://www.kingcounty.gov/environment/waterandland/stormwater/documents/pollution-prevention-manual.aspx>.

- (2) *The Permittee shall annually complete the number of inspections equal to 20% of the businesses and/or properties listed in their source control inventory to assure BMP effectiveness and compliance with source control requirements. The Permittee may count follow up compliance inspections at the same site toward the 20% inspection rate. The Permittee may select which sites to inspect each year and is not required to inspect 100% of sites over a 5-year period. Sites may be prioritized for inspection based on their land use category, potential for pollution generation, proximity to receiving waters, or to address an identified pollution problem within a specific geographic area or sub-basin.*

Approximately 450 stormwater pollution prevention inspections are planned for 2018,

roughly 20 percent of our estimated inventory.

Annexations may occur within King County over the next few years. Combined with the addition of new businesses and the closing of other businesses, there is some uncertainty about the number of businesses in unincorporated King County from year to year. The number of sites under this program will be in constant flux, requiring annual analysis to determine the 20 percent inspection goal.

(3) The Permittee shall annually complete the number of inspections equal to 20% of the businesses and/or properties listed in their source control inventory to assure BMP effectiveness and compliance with source control requirements. The Permittee may count follow up compliance inspections at the same site toward the 20% inspection rate. The Permittee may select which sites to inspect each year and is not required to inspect 100% of sites over a 5-year period. Sites may be prioritized for inspection based on their land use category, potential for pollution generation, proximity to receiving waters, or to address an identified pollution problem within a specific geographic area or sub-basin.

SWSS investigates all water quality complaints from citizens and county agencies as well as those referred to SWSS by outside agencies. Complaints can be made through online submissions at <http://www.kingcounty.gov/environment/waterandland/stormwater/problem-investigation-line.aspx>, or by calling the published complaint line at 206-477-4811. Calls are first screened to determine if the problem is within unincorporated King County and related to stormwater quality, then assigned to an investigator for immediate follow-up. If not within unincorporated King County or related to stormwater, the complainant is given the appropriate contact, whenever possible. As part of the complaint resolution, technical assistance is provided on any required source control BMPs and if necessary, a follow up letter with information is sent. Additional inspections or enforcement may follow. Depending on the nature of the problem, additional agencies may be brought in to assist with achieving compliance. All relevant complaints are investigated.

- iv. *Each Permittee shall implement a progressive enforcement policy to require sites to come into compliance with stormwater requirements within a reasonable time period as specified below:*
 - (1) *If the Permittee determines, through inspections or otherwise, that a site has failed to adequately implement required BMPs, the Permittee shall take appropriate follow-up action(s) which may include: phone calls, reminder letters or follow-up inspections.*
 - (2) *When a Permittee determines that a facility has failed to adequately implement BMPs after a follow-up inspection, the Permittee shall take enforcement action as established through authority in its municipal code and ordinances, or through the judicial system.*
 - (3) *Each Permittee shall maintain records, including documentation of each site visit, inspection reports, warning letters, notices of violations, and other enforcement records, demonstrating an effort to bring facilities into compliance. Each Permittee shall also maintain records of sites that are not inspected because the property owner denies entry.*
 - (4) *A Permittee may refer non-emergency violations of local ordinances to Ecology, provided, the Permittee also makes a documented effort of progressive enforcement. At a minimum, a Permittee's enforcement effort shall include documentation of inspections and warning letters or notices of violation.*

SWSS has had an enforcement program in place since 1995 and is in the process of being improved with changes to the County Code and the adoption of a Public Rules that provides a new and more relevant method of calculating penalties. The procedures for progressive enforcement include the issuance of a detailed Corrective Action Letter that specifies both what must be done to come into compliance and the deadline for doing it. King County personnel work with property owners, tenants, and business operators to help them achieve compliance. The assistance may include additional site visits, bringing in outside resources such as vouchers for hazardous waste disposal and storage, facilitating conversations between property owners and tenants, providing written materials, posting BMP signs, or phone calls and emails. When compliance is achieved, a Compliance Letter is sent.

King County makes every effort to bring facilities into compliance using site audits and technical assistance but in the very rare instance where compliance is not achieved, notices of violation are issued and additional enforcement action taken. Additionally, commercial sites are denied a discount on their SWM fee if source control BMPs are not implemented and if the onsite stormwater system is not properly maintained.

Records of inspection results, site photos, correspondence, etc., are all kept in paper and electronic formats. There are activity logs for each site, which document inspections dates, contacts, illicit connections, referrals to other agencies, etc.

- iv. *Permittees shall train staff who are responsible for implementing the source control program to conduct these activities. The ongoing training program shall cover the legal authority for source control, source control BMPs and their proper application, inspection protocols, lessons learned, typical cases, and enforcement procedures. Follow-up training shall be provided as needed to address changes in procedures, techniques, requirements, or staff. Permittees shall document and maintain records of the training provided and the staff trained.*

King County has an ongoing training program for employees conducting source control work. SWSS, the primary agency implementing the source control program, trains staff and updates staff training as needed. King County continues to update its list of employees, both existing and new, who require training under this section and addresses their training as they are identified. In addition, employees receive additional training through Ecology's Local Source Control Program.

Attachment 2017 Annual Report Question #34b:

Attach an updated list of planned, individual projects schedules for implementation during this permit term with the information and formatting specified in Appendix 11 (S5.C.6.c).

STRUCTURAL STORMWATER CONTROL PROGRAM

Projects planned and implemented as part of King County's Structural Stormwater Control Program seek to reduce stormwater quantity and quality impacts to waters of the state caused by existing developed land, and to prevent such impacts anticipated to be caused by future land development that are not adequately addressed through regulations or other required programmatic actions of the County's Stormwater Management Program (SWMP). Such impacts include, but are not limited to: increased runoff peaks, durations, and volumes; loss of groundwater recharge; increased pollutants in discharges; increased erosion and sedimentation; physical, chemical, and biological damage to aquatic habitat and biota; increased flooding and property damage; and, increased risks to human health and safety. The overall goal is intended to be achieved incrementally over time through implementation of the program's capital projects each year.

The planning process used to develop the Structural Stormwater Control Program, including:

- The geographic scale of the planning process.
- Issues and regulations addressed.
- Steps in the planning process.
- Types of characterization information considered.
- Amount budgeted for implementation.
- The public involvement process.
- A description of the prioritization process, procedures and criteria used to select the Structural Stormwater Control projects.

King County's planning process for its Structural Stormwater Controls Program is described below for the five types of projects that must be considered as part of the Structural Stormwater Controls Program per Permit Condition S.5.C.6.a.i.(1) through (5).

Stormwater Retrofit Projects

For stormwater retrofit projects (project types (1), (2), and (3) specified in Permit condition S.5.C.6.a.i), the planning process is currently in a state of flux as the County tries different planning approaches to identify, assess, and prioritize such projects for future funding. The stormwater retrofit projects considered include new flow control facilities/BMPs, new treatment facilities/BMPs, and retrofit of existing treatment and/or flow control facilities. The three approaches currently underway include the following:

Small Stream Basin Retrofit Planning Program

One of King County's approaches to stormwater retrofit planning is to focus on small, substantially developed stream basins. In such basins, the harmful effects of stormwater runoff from developed land are more pronounced and directly measureable due to less dilution by water from other sources (i.e., runoff from undeveloped land or groundwater inflow). In addition, full basin retrofitting will take less time and expense, so the expected benefits of retrofitting can be achieved and measured sooner in order to inform future retrofitting in larger basins. Another aspect of this approach is to focus on basins wherein degradation of stream health and water quality has been measured by monitoring data. This provides baseline data for assessing the effectiveness of retrofit actions.

In 2012, the County completed a high level capital needs assessment of 64 small stream basins scattered across unincorporated King County that have documented degradation of stream health and water quality based on two sets of available monitoring data. One was benthic index of biologic integrity (BIBI) data available at <http://www.pugetsoundstreambenthos.org/> and the other was water quality assessment data available at <http://apps.ecy.wa.gov/wqawa2008/viewer.htm>. The 64-basin assessment (updated in 2013 to 67 basins) is a compilation of key information for each basin (e.g., basin size, land covers, soil types, BIBI scores, impaired water body listings, etc.) which is used to prioritize the basins for stormwater retrofitting efforts. Included in the prioritization information is Ecology's integrity score, which comes from Ecology's Stormwater Target Watersheds map provided in their 2013 Solicitation for Proposals to Conduct Stormwater Retrofit Planning and Pre-design. The 67 basins are currently prioritized to favor the following:

- Relatively small basin size with a significant amount of developed land
- Presence of BIBI monitoring stations with baseline data from which to measure retrofit effectiveness
- Baseline BIBI data in the fair or worse range for the basin
- Developed vs. predeveloped runoff peaks indicating a likely unstable or scoured stream channel
- Location within an Ecology stormwater target watershed with a high integrity score

The funding for this program was established for the first time in 2013/14 and has been used to leverage grant funding for two small basins so far: Evans Creek Tributary 108; and, May Creek Tributary 291A. A third basin, Monticello Creek, will also receive funding from this program for the County's share of the match required for an Ecology retrofit planning grant just applied for by the City of Redmond. Program funding and grant funding add up to about \$300,000 for each of these basins. This cost includes basin characterization, runoff modeling, and design of a basin-wide system of conceptual retrofits that work together to meet a regulatory performance standard at the mouth of the basin (e.g., one or more of Ecology's regulatory performance standards for LID, flow control, and treatment). The cost also includes public outreach on the planning effort and

several pre-designs of retrofit projects selected from the basin-wide system of conceptual retrofits based on cost vs. benefit. The pre-designs will be used to compete for construction grant funding expected to be offered by Ecology later this year.

Additional funding appropriation for this program will be requested in the next biennium budget request. This funding will be used to (1) do conceptual retrofit planning in two new high priority small stream basins, (2) do additional pre-designs for the small stream basins where conceptual planning has already been done, and (3) leverage grant funding for construction of retrofit projects.

A variation of this planning approach will be explored wherein opportunity sites are identified within a basin for retrofit projects that can be designed to meet a regulatory performance standard for the developed area draining to the site. Such an approach can potentially generate pre-designs more quickly because the step of basin-wide systematic design is skipped.

Larger Basin Plans

The County has and will continue to participate in larger basin planning efforts to identify stormwater control projects and other actions to mitigate the stormwater impacts of past, present, and future development. During this permit term, the County is leading three multi-jurisdictional planning efforts that have or will identify stormwater retrofit needs. These include the WRIA 9 Stormwater Retrofit Plan, the Miller/Walker Creeks Stormwater Retrofit Plan, and the Bear Creek Stormwater Basin Plan. Public outreach was or will be a component of all these planning efforts.

The WRIA 9 stormwater retrofit planning effort is an EPA-grant-funded effort with an estimated cost of \$1.3 million. It has identified unit retrofit needs (i.e., number of rain gardens, number of rain barrels, and number of detention facilities) across the developed landscape that would collectively achieve flow regime restoration goals in the many streams that are tributary to the Green/Duwamish River. Although the effort did not identify, site, or pre-design specific retrofit projects, it did estimate the overall cost of stormwater flow control retrofitting in each of the stream basins that comprise the study area and suggested that a large share of the retrofitting could be achieved through regulatory redevelopment requirements as each basin slowly redevelops over the next 30 to 100 years. Such information will be useful in prioritizing and structuring future, more detailed retrofit planning efforts in the watershed.

The Miller/Walker Creeks stormwater retrofit planning effort is funded through an Ecology/National Estuary Program grant. The estimated project cost is approximately \$250,000. It identifies, assesses, and prioritizes 80 sites across the basin for stormwater retrofit projects. The criteria for prioritization are currently being developed by the multi-jurisdictional project management team. The planning effort will select at least three sites and develop pre-designs for retrofit projects at those sites. The pre-designs

will be used to compete for construction grant funding expected to be offered by Ecology later this year and in coming years.

The Bear Creek stormwater basin planning effort is estimated to cost over \$2 million and is a multi-jurisdictional effort being performed by King County to comply with the Permit's watershed-scale stormwater planning requirement. Because the Bear Creek basin is largely developed, a major focus of the effort will be to identify a conceptual list of retrofit projects for future implementation. Further planning will be needed after the basin plan to develop pre-designs for these projects to seek local funding and state/federal grant funding for implementation. The order of project implementation will be likely be prioritized based on cost vs. benefit.

Property Acquisition Projects for Flow Control/Water Quality Benefits

King County prioritizes acquisitions based on a variety of information, including but not limited to salmon recovery plans, the Flood Hazard Management Plan, basin plans, habitat studies, recreation plans, stormwater management plans, and staff expertise.

Generally, lands identified for acquisition have conservation value in one or more of the following categories: agricultural production, forestry, ecological protection and restoration, flood risk reduction, passive recreation, strategic growth management community separators, and stormwater benefits (both by preserving naturally high functioning sites and by acquiring sites for facilities). It is often the case that a single property will meet more than one conservation objective. For example, a forested property in the headwaters of a rural stream system may have fish and wildlife benefits, forest health benefits, and stormwater benefits related to preserving water quality and retaining surface water.

Increasingly, staff who plan acquisition strategies are examining the landscape for acquisitions that would achieve multiple benefits. In many cases such planning efforts are informed by sophisticated modeling efforts, including the Department of Ecology's Watershed Characterization model. The Watershed Characterization model is particularly useful in stormwater acquisition planning for its ability to identify basins across the landscape where additional protection and restoration actions would have the greatest impact on improving water quality and water flow functions.

King County has also developed a process to address Type 2 drainage problems in the Structural Stormwater Control program. King County's Stormwater Services Section is made aware of Type 2 drainage problems either through drainage complaints or while conducting outfall reconnaissance surveys. If a Type 2 drainage problem is found, each problem is to be evaluated through a feasibility study to prioritize the problem and identify potential solutions. Upon completion of the feasibility study, a plan is enacted to address and correct the problem area.

Maintenance Projects with Capital Construction Cost \geq \$25,000

The planning process for these types of projects includes the following steps:

- 1) A problem is identified during regular inspection of a stormwater control facility/best management practice (BMP) that appears to require capital construction to fix.
- 2) An engineering review is performed to confirm the problem and a rough estimated cost to fix.
- 3) The problem is referred to the stormwater capital program where more detailed assessment and costing is done to create a capital project.
- 4) The problem is prioritized with other stormwater capital projects for funding.

STRUCTURAL STORMWATER CONTROLS LIST

KING COUNTY

Project Name	Type ¹	Start Year	Status ²	End Year	Cost Estimate ³	Funding (%)			WQ Benefit (Est. TSS or TS reduction lbs/yr) ⁴	Hydro Benefit (Est. Avg. % flow reduction) ⁵	Hydro Benefit Option #	Retrofit Incentive ⁶	Other Benefit	Monitoring Planned (Y/N)	Lat / Long (X, Y)	Receiving water body name	Comments
						Local	State	Federal									
Clough Creek Buyout and Sediment Facility	1	2013	4. Complete/ Maintenance	2018	\$1.7M	51	7	42	N/A	N/A	N/A	N/A	Flood reduction	Yes	47.47354/-121.78639	Clough Creek	Construction of facility to capture excess sediment from Clough Creek.
Issaquah Hobart Road at NE 113th St	1	2013	2. Design and permitting	2014	\$200K	100			N/A	100	2a	0.75	None	Yes	47.48462/-122.02791	Issaquah Creek	Provide bioretention.
Kirkland Pump Station Upgrade	1	2002	3. Construction	2014	\$75K	100			N/A	100	2a	N/A	None	No	47.676445/-122.203728	Lake Washington	Joint King County-City of Kirkland project. Install silve-cell system to increase infiltration around landscaped area and pervious asphalt paving on the street. Upon completion, the street will be turned over to the City.
Evans Creek Tributary 108 Basin-wide Retrofit Siting	2	2013	4. Complete/ Maintenance	2014	\$300K	24	86		N/A	N/A	N/A	N/A	None	Yes	47.675415/-122.056882	Evans Creek	Planning and pre-design for three retrofit projects with detention and bioretention stormwater facilities.
May Creek Tributary 291A Small Basin Retrofit	2	2013	4. Complete/ Maintenance	2014	\$216K	45	55		N/A	N/A	N/A	N/A	None	Yes	47.49543/-122.12522	May Creek	Planning, pre-design, and final design to for one retrofit project with detention and bioretention stormwater facilities.
North Base Stormwater ISGP Upgrade	2	2013	1. Planning	2015	\$500K	100			N/A	N/A	N/A	7	None	Yes	47.74691/-122.3013	Thomton Creek	Additional treatment units installed within an existing stormwater system. Monitoring will take place at outfall.
Cedar Grove Road Water Quality Pond	2	2013	2. Design and permitting	2014	\$200K	100			N/A	N/A	N/A	6	Habitat	Yes	47.43985/-122.06384	Cedar River	Construct water quality pond to reduce sediment load from road. Pit sites along the road have significant track out. Source control enforcement is also being pursued.
Avondale Rd	2	2013	2. Design and permitting	2014	\$150K	100			N/A	100	2a	0.5	None	Yes	47.71543/-122.09057	Cottage Creek	Retrofit bioretention swale within right-of-way to treat runoff from high use intersection.
Kerristan Rd Flow Dispersion	2	2013	4. Complete/ Maintenance	2013	\$74K	100			N/A	100	2b	1.5	None	Yes	47.42845/-121.9294	Rock Creek	Disperse flow to reduce erosion and increase infiltration.
Covington-Sawyer Rd at 179 Ave SE	2	2013	2. Design and permitting	2015	\$200K	100			N/A	100	2a	0.25	None	Yes	47.295278/-122.273333	Soos Creek	Bioretention system.
Dockton Rd	2	2014	2. Design and permitting	2014	\$500K	100			N/A	100	2a	0.7	None	Yes	47.41245/-122.43744	Puget Sound	Construct bioinfiltration swale.
Black Diamond Ravensdale Rd	2	2014	2. Design and permitting	2014	\$60K	100			N/A	100	2a	1	None	Yes	47.34711/-121.98993	Ground	Construct bioinfiltration swale.
140th Avenue SE at SE Petrovsky Road	2	2014	2. Design and permitting	2014	\$100K	100			N/A	N/A	N/A	1	None	Yes	47.44557/-122.15501	Cedar River	Enhance existing retention/detention pond to treat runoff from high use intersection.
Issaquah Hobart Road SE at SE May Valley Road	2	2014	2. Design and permitting	2014	\$100K	100			N/A	N/A	N/A	0.4	None	Yes	47.48462/-122.02791	Issaquah Creek	Construct water quality swale to treat high use intersection stormwater runoff.
SMag CSO Control Project Storage Facility	2	2014	3. Construction	2015	\$254K	Applied for state funding			7	100	2c	0.49	None	No	47.63298/-122.38664	Elliott Bay	Landscaped infiltration via underdrains; driveway and roof runoff collected and routed to bioswales.
North Beach Pump Station and CSO Control Facility	2	2014	3. Construction	2015	\$140K				1	N/A	2c	0.08	None	No	47.701533/-122.390417	Puget Sound	State partially funded design. State funding of construction TBD. Area contributing to project for water quality benefit evaluation is drainage area to StormFilter catch basin insert.
Seola Creek Basin Facility Upgrade and Retrofit	3	2010	4. Complete/ Maintenance	2015	\$1.5M	35	65		30,911	18	1	304	None	Yes	47.51044/-122.36880	Seola Creek	Retrofit to add a wetpool to a flow control facility; partially funded by Ecology Grant 120062.

STRUCTURAL STORMWATER CONTROLS LIST

KING COUNTY

Project Name	Type ¹	Start Year	Status ²	End Year	Cost Estimate ³	Funding (%)		WQ Benefit (Est. TSS or TS reduction lbs/yr) ⁴	Hydro Benefit (Est. Avg. % flow reduction) ⁵	Hydro Benefit Option #	Retrofit Incentive ⁶	Other Benefit	Monitoring Planned (Y/N)	Lat / Long (X, Y)	Receiving water body name	Comments
Tuscani Facility Remediation	3	2011	4. Complete/ Maintenance	2013	\$124K	100	Local	118	100	1	8.2	None	Yes	47 70591 / -122.07458	Bear Creek	Retrofit of flow control facility to stormwater wetland.
Military Rd at S 342nd	3	2013	3. Construction	2014	\$300K	100	Local	N/A	100	2a	0.25	None	Yes	47 34361 / -122.100833	Green River	Provide bioretention.
Kerriston Culvert	5	2014	2. Design and permitting	2014	\$540K	100	Local	N/A	N/A	N/A	0.25	Fish passage	Yes	47 436164 / -121.853633	Rock Creek	Control overflow from washing fines off gravel road surface; project is one element of a S4.F response undertaken by King County to address stormwater impacts caused by this gravel road.
Cedar Valley Facility Remediation	5	2013	4. Complete/ Maintenance	2013	\$77K	10	90	164	100	1	11.4	None	Yes	47 38643 / -122.01941	Cedar River	Conversion of a settling pond into a wetpond; partially funded by Ecology Grant G1100216.
Evans Creek Tributary 108 Detention Vault Retrofits	3	2016	4. Complete/ Maintenance	2018	\$670K	28	72	32	100	1	1	None	Yes	47 67299 / 122.06376	Evans Creek	Design and construct two stormwater retrofit detention vaults in right of way, in front of addresses 20620 and 20626 NE 76th Place and 20508 NE 78th Street. Partially funded by Ecology Grant WQC-2016-KCW/LRD-00056.
May Creek Tributary 291A Stormfilter Retrofit	3	2016	2. Design and Permitting	2020	\$141K	45	55	14	N/A	N/A	1	None	No	47 48626 / 122.12312	May Creek	Design and construct a Stormfilter system in right of way in front of parcel 3243200030 near Renton, WA. Grant not awarded.
Wilderness Rim Pond	3	2016	4. Complete/ Maintenance	2016	\$40K	60	40	N/A	N/A	N/A		Flood reduction	No	47 444557 / -121.773907	Snoqualmie River	Berm to protect nearby residential properties and associated septic systems from infiltration pond overflow. FEMA grant E15-170
Wilderness Rim Berm and Pond Excavation	3	2016	3. Construction	2016	\$235K	60	40	N/A	N/A	N/A		Flood reduction	No	47 444557 / -121.773907	Snoqualmie River	Berm to protect nearby residential properties and associated septic systems from infiltration pond overflow. FEMA grant E15-170

Notes

N/A - not available or not applicable
WQ - water quality
TSS - total suspended solids
TS - total solids
FEMA - Federal Emergency Management Agency

¹ Type

1. New flow control facility, including Low Impact Development (LID) Best Management Practices (BMPs)
2. New treatment facility (or treatment and flow control facility), including LID BMPs
3. Retrofit of existing treatment and/or flow control facility
4. Property acquisition for water quality and/or flow control benefits (not associated with future facility)
5. Maintenance with capital construction costs ≥ \$25,000

² Status (as of December 31st of the reporting year)

1. Planning
2. Design and permitting
3. Construction
4. Complete/ Maintenance
5. Project Cancelled
6. Property acquisition

³ Cost Estimate - Costs to be updated to reflect final costs when Status 4 or 6 is reached.

⁴ WQ Benefit - KC S8.d loading rates used for LDR, HDR, Commercial land use types

⁵ Hydro Benefit

1. Project's volume ratio
- 2a. 1 00%
- 2b. 1 00%

⁶ Retrofit Incentive - From Washington State Department of Ecology

Retrofit Incentive Table

Attachment 2017 Annual Report Question #13:

Describe in comments field opportunities created for the [public to participate in the decision making processes involving the development, implementation and updates of the SWMP (S5.C.4.a).

2.1.4 Public Involvement and Participation – S5.C.4

Permittees shall provide ongoing opportunities for public involvement and participation in the Permittee's SWMP and implementation priorities.

Minimum performance measures:

- a. Permittees shall create opportunities for the public to participate in the decision-making processes involving the development, implementation and update of the Permittee's SWMP.*

As part of the annual update process, King County invites public comment on the contents of the SWMP Plan. King County will advertise the comment period through its website at www.kingcounty.gov/environment/wlr/sections-programs/stormwater-services-section/stormwater-program/public-review.aspx, [social media](#), and email notifications sent to potentially interested parties through distribution lists. All feedback received during the public comment period will be reviewed and considered prior to finalization of the SWMP Plan.

In addition to input received during the SWMP Plan public comment period, King County welcomes feedback year round. Comments may be emailed to Stormwater@kingcounty.gov or mailed to Stormwater Management Team, King County Dept. of Natural Resources and Parks, 601 S. Jackson St., Suite 600, Seattle, WA 98104.

King County also engages the public in decision-making processes when it comes to siting, construction, and maintenance of County-initiated capital projects.

- b. Each Permittee shall post on their website their SWMP Plan, and the annual report required under S9.A no later than May 31 each year. All other submittals shall be available to the public upon request.*

No later than March 31st of each year beginning in 2015, King County will post its updated SWMP Plan online at www.kingcounty.gov/environment/wlr/sections-programs/stormwater-services-section/stormwater-program.aspx. Other submittals related to the Municipal Permit are available upon request by sending an email to Stormwater@kingcounty.gov.

Attachment 2017 Annual Report Question #72:

Attach a description of any stormwater monitoring or stormwater-related studies per S8.A.

2017 Annual Report Question 72: Description of any stormwater-related studies per S8.A

- King County maintains 74 water quality monitoring stations on creeks and rivers in King County. These stations are visited once per month, which can include storm events, for multiple water quality parameters. These data are used to characterize current water quality conditions in creeks and rivers in King County, and to assess how those conditions change over time. More information about this program can be found here: <http://green2.kingcounty.gov/streamsdata/>.
- King County maintains stream flow gages in most streams and creeks in King County. These flow gages track water quantity every 5 or 15 minutes. Flows during storm events are captured as part of this effort. These data are used to characterize current flow conditions in streams and creeks in King County, and to assess how those conditions change over time. More information about this program can be found here: <http://green2.kingcounty.gov/hydrology/>.
- King County conducts monitoring to identify sources of bacteria in several King County creeks. In 2017, bacteria source tracking investigations were conducted in Issaquah Creek, Newaukum Creek and Boise Creek. Investigations were also conducted in 2017 in Juanita Creek in cooperation with the City of Kirkland, and in Thornton Creek in cooperation with the City of Seattle. Additional source tracking efforts using data loggers was funded through Council and SPU Water Works grants. These investigations helped further identify where the high fecal coliform bacteria maybe coming from agricultural (e.g., dairy/cattle) sources and human sources. Collaborative source tracking work with the City of Kirkland in the Juanita Creek basin helped narrow down potential human sources of bacteria to a two block area where some older septic systems are known to exist. Work in the Thornton Creek basin with Seattle Public Utilities has resulted in the identification and elimination of two illicit discharges of raw sewage into the stormwater system in the creek through the use of continuous conductivity/temperature data loggers and automated water samplers.
- King County provides stormwater and surface water monitoring services to the City of Mercer Island. In 2017 a grant through the Department of Ecology was awarded to test the effectiveness of using oyster shells to retrofit stormwater basins in the town of Mercer Island.
- King County commenced a short-term monitoring project in Hicklin Lake drainage in 2017. Hicklin Lake is located in White Center, an unincorporated urban area. The project goal is to collect water quality and flow data in the stormwater conveyance network suitable for estimating pollutant loading. Project funding will be used to support a lake and stormwater management plan.