# City of Spokane Stormwater Management Program Plan

March 2022

*Prepared by:*

City of Spokane
Wastewater Management
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# 1.0 INTRODUCTION

## 1.1 Purpose

Stormwater in the City of Spokane is regulated by the Eastern Washington Phase II Municipal Stormwater Permit (the permit) issued by the Washington State Department of Ecology (Ecology). The permit requires the development and implementation of a Stormwater Management Program (SWMP) that addresses permit Sections S5, S7, and S8. This Stormwater Management Program Plan (the plan) has been prepared to provide information to the public on the activities and means that the City of Spokane (the city) expects to implement in order to protect local water quality and satisfy the conditions of the permit.

The permit requires that a municipal Stormwater Management Program consist of six elements that, when implemented, will ensure that local water quality is protected. Section S5 of the permit, *Stormwater Management Program for Cities, Towns, and Counties,* details the six elements as:

(1) Public Education and Outreach,

(2) Public Involvement and Participation,

(3) Illicit Discharge Detection and Elimination,

(4) Construction Site Stormwater Runoff Control,

(5) Post-Construction Stormwater Management for New and Redevelopment, and

(6) Municipal Operations and Maintenance.

Section S7 of the permit, *Compliance with TMDL Requirements*, requires implementation of the Total Maximum Daily Load (TMDL) monitoring detailed in Appendix 2 of the permit, and Section S8 of the permit, *Monitoring and Assessment*, details the requirements to implement stormwater management effectiveness studies.

The draft SWMP Plan is posted made available to the public annually via the city's stormwater website (Spokanestormwater.org) on or before April 1st of each year. The draft plan is posted for 30 days, at which time the public may submit comments on the draft plan. After the 30 day draft period, the SWMP Plan will be finalized and posted to the website on or before May 1st of each year. Comments on the final SWMP Plan will be accepted anytime throughout the year and considered for inclusion during the next plan revision.

## 1.2 Regulatory Background

Created in 1972 by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) is a federal requirement that regulates stormwater and wastewater discharges to "Waters of the United States". The Environmental Protection Agency (EPA) authorizes States to implement the NPDES program and perform many of its' permitting, administrative, and enforcement aspects. The regulatory authority

in Washington State is the Washington State Department of Ecology (Ecology), who regulates stormwater west of the Cascade mountains with the Eastern Washington Phase II Municipal Stormwater permit. The permit is a quasi-combination NPDES and State Waste Discharge General Permit for discharges from small municipal separate storm sewers in Eastern Washington.

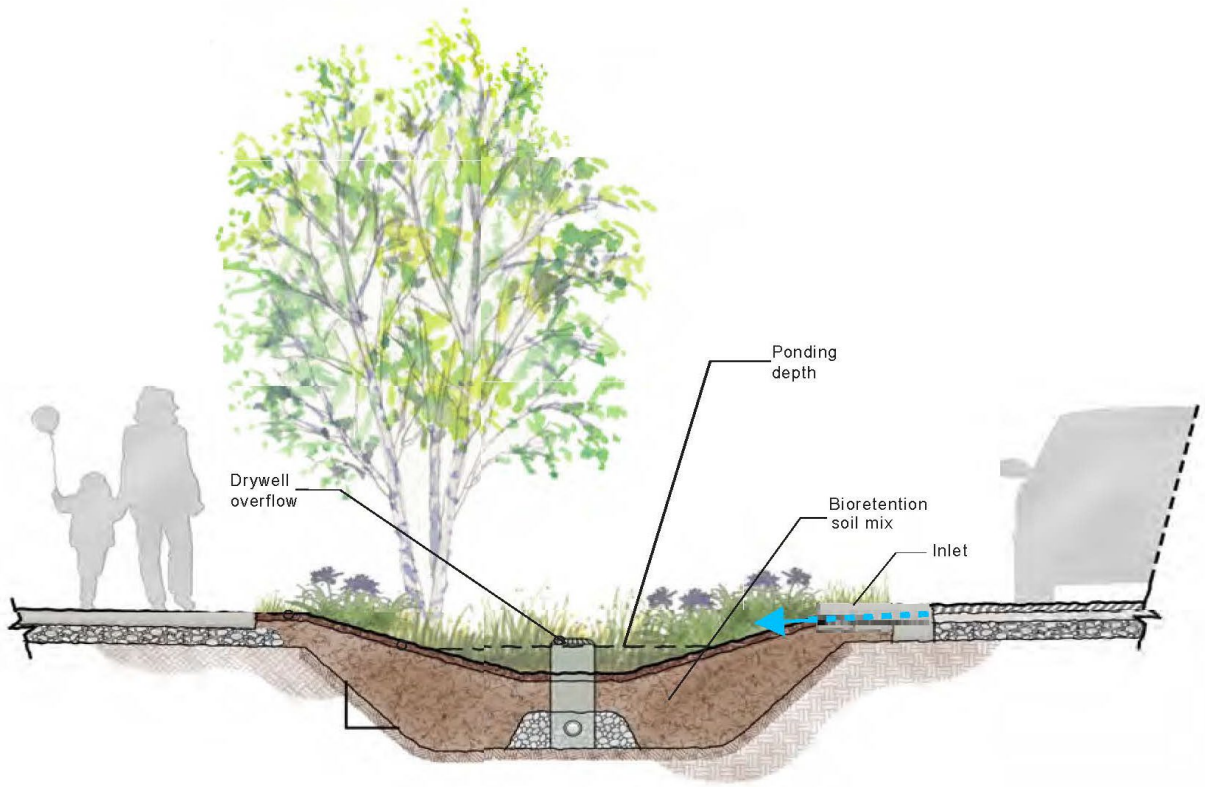
Ecology first issued the permit to municipalities in 2007, and has reissued it three times since 2007 with revisions in 2014 and 2019. The current permit became effective on August 1, 2019 and is set to expire July 31, 2024. The city is authorized to discharge stormwater to surface waters and to groundwaters of the State from the city's Municipal Separated Stormwater Sewer System (MS4) in accordance with the permit. The entire incorporated area within the city's geographic boundary is considered the MS4 and stormwater is managed in accordance with the stormwater permit. There are several combined sewer overflow (CSO) basins within the regulated MS4 that collect and convey stormwater to the Riverside Park Water Reclamation Facility (RPWRF) for treatment. Surface waters that flow on hard surfaces and are collected and conveyed within infrastructure in the CSO basins are regulated under a NPDES waste discharge permit, and managed accordingly. Stormwater within CSO basins is, in large part managed in a combined sewer system, with exception of occasional structural treatment BMPs that manage stormwater locally and discharge to ground.

## 1.3 Stormwater Management in Spokane

The city's MS4 system consists of catch basins, piping, structural BMPs, outfalls, and underground injection controls (UICs). Within the permitted MS4 boundary, but outside of the CSO Basins, stormwater is collected by the separated stormwater sewer system and conveyed to stormwater treatment facilities, and/or directly to outfalls that discharge to the river. The separated stormwater sewer system and stormwater treatment facilities manage stormwater separate from sanitary wastewater, and is generally located in the North/Northwest portion of the city.

Stormwater treatment facilities can be found throughout the city's MS4, and are used to manage stormwater as near as possible to where the runoff is generated. The treatment facilities are generally swales, bioretention cells, infiltration ponds, etc., which are structural stormwater BMPs designed to remove pollutants from runoff. The facilities are typically designed and constructed in accordance with the Spokane Regional Stormwater Manual (SRSM), and consist of inlets, a vegetated retention area, subgrade bioretention soil media, and an outlet/overflow. They are designed to retain water to approximately six inches depth, and have drywells to serve as overflows. Treatment facilities range in size from a small roadside swale that receives drainage from a parking lot, to of a large dry pond that treats stormwater for an entire neighborhood, but the treatment processes are the same. Stormwater enters the treatment facility through an inlet, flows over vegetation slowing it down, and infiltrates into the ground through bioretention soil media. The vegetation, bioretention soil media, and microbes in the soil are providing treatment to the stormwater and removing any pollutants. Figure 1 shows a typical swale design.

**Figure 1. Typical Swale Design.**

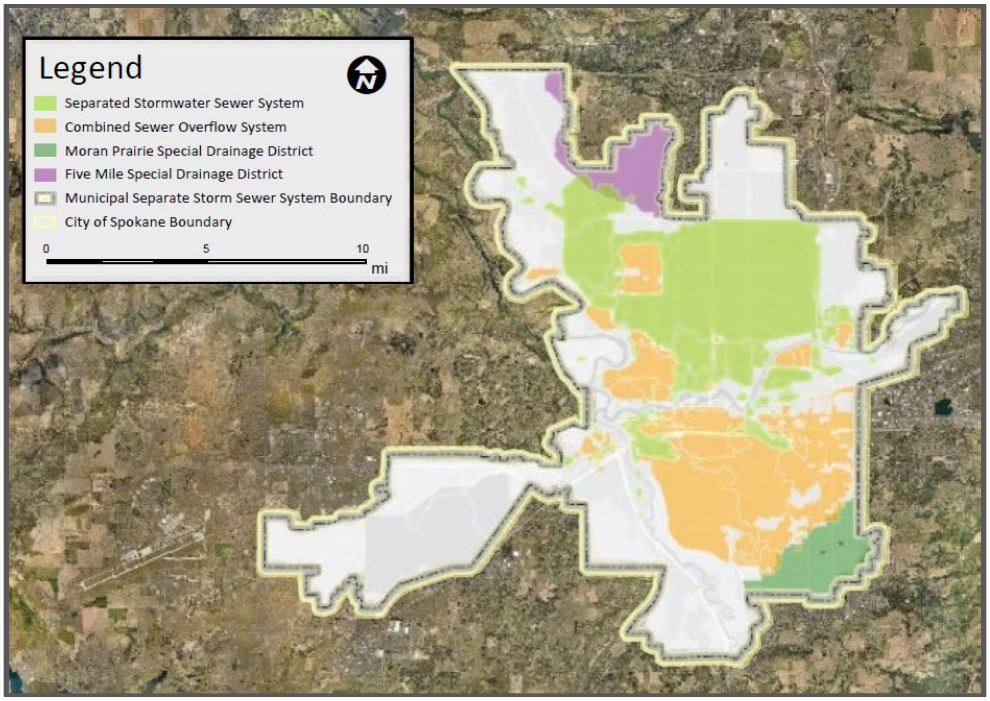



Typical Swale Design

Special Drainage Districts (SDD's) have been established where typical stormwater treatment BMPs may not be effective because treatment via standard infiltration approaches is not practical. The Moran Prairie and Five Mile SDD's have been exist because of the challenges that managing stormwater in those areas presents due to shallow groundwater, intermittent standing water, or steep slopes.

Figure 2 is a map of the City of Spokane that shows the generalized locations of the stormwater infrastructure systems. On the south side of the city, where geology does not readily allow infiltration, stormwater in CSO basins is largely managed in a combined sewer that conveys stormwater and sanitary wastewater in the same infrastructure. The CSO systems consist of catch basins, piping, and storage tanks that are used to collect and convey the stormwater to RPWRF. The CSO facilities are used to minimize or eliminate discharges of the combined sewer and stormwater, and are regulated by the waste discharge permit that the RPWRF operates under. CSO basins also contain stormwater treatment BMPs, where practical, to manage stormwater that has not been combined with sanitary sewer locally and to minimize the amounts of stormwater that are conveyed to the wastewater treatment plant.

**Figure 2. Map of stormwater management areas.**




## STORMWATER MANAGEMENT PROGRAM COMPONENTS

## 2.1 Public Education & Outreach

### 2.1.1 Public Education and Outreach Permit Requirements (S5.B.1)

Section S5.B.1.a of the permit requires the city to implement a public education and outreach program designed to reach the general public, businesses, and engineers/developers to achieve improvements in the target audiences' understanding of stormwater and how they can contribute to water quality protection. Outreach to the general public should focus on water quality impacts and tangible actions that the general public can take to protect water quality. The focus of the outreach to businesses should focus on education on preventing illicit discharges appropriate materials management. engineers/developers should receive outreach focused on technical standards, the use of BMPs and developing erosion control plans.

Section S5.B.1.b of the permit requires the city to measure the understanding and adoption of targeted behaviors for at least one target audience in at least one subject area, and use the results to direct ongoing education and outreach resources most effectively.

### 2.1.2 Public Education and Outreach Program Introduction

The central mission of the city's PE&O program is to inform target audiences about the value in improving water quality by reducing stormwater pollution through understanding stormwater dynamics, source control, and the value of green stormwater infrastructure (i.e. bioretention treatment facilities). The city's stormwater education and outreach was hindered in 2021 due to restrictions that were implemented during the pandemic. With the lifting of restrictions on public gatherings, it is expected that there will be an increase in opportunities for the city to perform outreach at public events and in classrooms in 2022.

The city's Wastewater Management Department recently created, and filled, a Public Education and Outreach Coordinator position. The new role will focus solely on stormwater and wastewater outreach, which will include social media messaging, attending public events, overhauling the city's stormwater website, and re-establishing a presence in the classrooms, among other public engagement. In addition to the new position, the department has established a contract with a local multi-media vendor to establish a more pronounced stormwater presence on social media channels to inform, engage, and network with the community for stormwater stewardship. The current focus of the outreach program is to continue performing outreach using the vehicles currently in place, as well as to establish additional methods to reach the public. The methods the city employs for education and outreach are discussed in *Section 2.1.2.2 - Education and Outreach Methods*.

#### *2.1.2.1 Elements of the PE&O Program*

Public Education & Outreach PE&O efforts focus on reaching the general public, business sectors, property developers, and children in the classroom, which are the target audiences.

***General Public***

The objectives of outreach to the general public, specifically rate paying households and residents on social media, is to increase the stormwater knowledge base of the community. The ultimate goal is increasing the practice of source control, ownership and appreciation for stormwater treatment facilities, and in overall investment in stormwater stewardship. Census data from 2019 indicate that there are approximately 522,798 residents and 223,079 housing units in the City of Spokane, where. 202,811 of the housing units are households with 2.41 persons per household on average. So, approximately 488,775 residents live in households, where approximately 87% of households in Spokane have internet access. This means that the city could potentially reach 93% of the population by targeting the general population that reside in households, who receive a utility bill and have the ability to engage online.

Education and outreach resources have been increased by the Wastewater Department to affect change and realize behavior change for the general public. Specifically, outreach methods will include social media messaging, solicitation of public engagement with the city's stormwater website, presentations to neighborhood councils, and attendance/presentations at public events. A final behavior evaluation will be performed via survey after some time to measure the change from baseline.

***Business Sectors***

The city has established a partnership with the Spokane Regional Health District (SRHD) to perform outreach with the business community. SRHD receives funding from Ecology as part of the Pollution Prevention Program with the goal of educating businesses to increase pollution prevention behaviors. The city does not compete with SRHD for the limited Ecology funding to perform outreach to the community SRHD currently reaches. In addition, the city writes letters of recommendation to Ecology in support of SRHD receiving funding.

With input from the city SRHD selects target audiences, and focuses on the restaurant, lodging/hospitality, automotive, and property management business sectors. If necessary, the SRHD inspector will follow up with the city if there are areas of concern pertaining to illicit discharges identified during inspections. Likewise, during illicit discharge investigations, city stormwater inspectors will recommend visits from SRHD to businesses who would benefit. In 2021, SRHD conducted 8 screening visits, 35 initial visits, and 10 follow-up visits, for a total of 33 visits total. The city will continue to partner with SRHD to affect behavior change in local businesses with respect to stormwater.

***Developers, Engineers, and Contractors***

The City of Spokane Developer Services Center works with developers from the design phase through permitting and issuance of Certificates of Occupancy. Throughout that process the Center provides verbal guidance and support materials for appropriate stormwater management that is necessary to receive city permits to construct. Pre-development meetings with project proponents are standard practice, where during the meetings, city engineers meet with developers, their engineers, and contractors to discuss the scope of the project, to establish stormwater requirements, and identify improvement opportunities. Pre-development meeting notes are provided to the project proponents, and detail the guidance provided during the discussions, and include a notification of stormwater training opportunities the project proponents. In 2021 the Center reviewed and provided guidance on 143 stormwater plans for development projects.

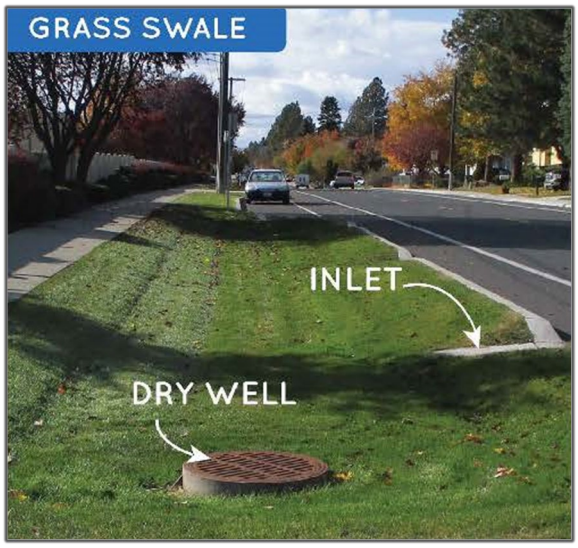
Guidance materials provided to project proponents include, but are not limited to, the City of Spokane Stormwater Compliance Guide, and the Understanding Stormwater Permitting in the City of Spokane guide, each of which contain numerous links to additional educational stormwater materials. The city will continue to provide outreach to the development community through the Developer Services Center to affect behavior change with respect to stormwater.

***Classrooms***

The city's classroom stormwater education and outreach was combined with the water stewardship and conservation outreach program. The water education and outreach program has historically had a very strong focus on children in the classroom, but due to the corona virus pandemic, the program had limited opportunities to engage the younger generations in the classroom. In 2021, no stormwater outreach was performed to children in the classroom. However, the city's Wastewater Department has increased personnel to re-establish a stormwater education presence in the classrooms, and is currently determining the methods and frequencies of outreach that will provide the most benefit.

### *2.1.2.2 Education and Outreach Methods*

**Neighborhood Council Meetings:** The Wastewater Management Department attended neighborhood council meetings virtually and in person throughout the city in 2021 to provide information on pollution prevention and stormwater facility maintenance. Eleven neighborhood council meetings were attended in 2021. Two brochures titled Managing Stormwater - A Residential Guide and Stormwater Pollution Guide were provided as outreach materials, or referenced as available online. at the neighborhood council meetings. The department will continue to attend neighborhood council meetings in 2022 and give a brief presentation on stormwater management and swale maintenance, hand out brochures that provide the messaging in greater detail, answer any questions the community might have, and reiterate our availability to address any concerns they may have.

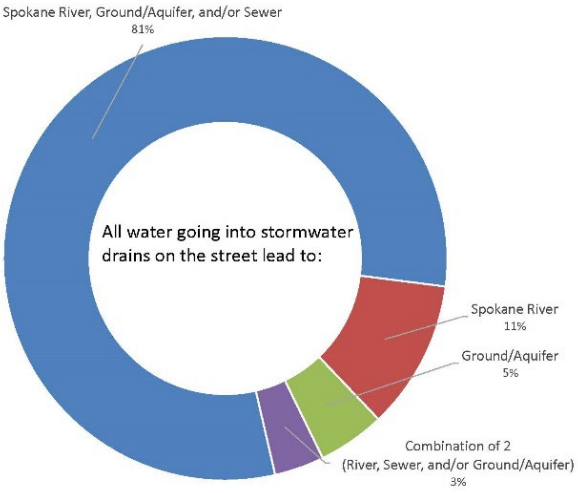



**TRIMMING, THINNING & MOWING**
Keeps vegetation healthy & provides space for stormwater

**REMOVING SEDIMENT & DEBRIS**
Promotes infiltration while keeping vegetation healthy

**CLEARING BLOCKED INLETS**
allows stormwater to enter swale

**Stormwater Survey:** The portion of the general public that reside in households that receive a utility bill and have the ability to engage online were targeted for the measurement of the understanding of stormwater management. In 2019, the city sent out a mailer with utility bills that offered a rebate on a water bill to complete an online stormwater survey. The survey established a baseline measurement of the stormwater knowledge base, and the results indicated that there is room to improve the knowledge base on illicit discharges and the function, and maintenance responsibilities, of stormwater treatment facilities. The survey had nearly 1400 respondents, and the information received from the survey was used to tailor outreach for the years 2020 and 2021. Messaging will continue to focus on illicit dishcharges and stormwater treatment facilities and after some time a follow up survey will be sent out via mailer to measure the change in the knowledge base.




**Stormwater Education in the Classroom:** The Franklin County Conservation District created the Drain Rangers educational program using Ecology funding. The program developed materials specific to stormwater education focused for kindergarten through 5th grade students. The materials were created in templates that are available for school districts to leverage into their programs, including curriculums, lesson plans, and exercise. The city is evaluating how to incorporate the Drain Rangers materials into local Spokane School District classroom, which will require engaging specific schools and school teachers to assess interest. In 2022 the Drain Rangers program will be tailored to the Spokane Region, and the materials will be presented to Spokane School District schools to develop interest in adopting the materials into local curriculums.

**Cable 5:** City of Spokane Cable Channel 5 rotates stormwater pollution prevention tips on the reader board. A different seasonally relevant tip was used each week. An EPA video entitled "After the Storm" is shown throughout the year, highlighting the importance of stormwater management and individual citizen responsibility to help prevent stormwater pollution. Cable 5 also broadcasts stormwater outreach videos as filler between scheduled programming. These broadcasts will continue to occur in 2022.

**Idaho Washington Aquifer Collaborative:** Is a non-profit organization that is made up of Idaho and Washington water purveyors, and the city is a member of the organization. IWAC developed an educational video for the public that is an overview of the Spokane Valley Rathdrum Prairie aquifer, its importance to our region, the impact stormwater has on river and aquifer water quality, sources of pollution, and things that residents can do to protect and preserve our water. for the public to understand the importance of stormwater pollution and water. The video is currently aired on Cable 5 in continuous rotation on its air and will continue to be aired in 2022.

**Website:** The internet domain Spokanestormwater.org was created to direct people to the city's stormwater website in the Public Works and Utilities webpages section, where stormwater information has been elevated one level to its own page on the new website. Web users seeking stormwater information are now able to find it more quickly. Upon the reissuance of the 2014-2019 stormwater permit, the city published an article titled 'Managing stormwater protecting the Spokane River', which is still available online. The article described the Permit and the city's efforts to improve water quality in the river. The website is updated as necessary as additional articles are written and activities occur.


In the year 2020 the city updated the Green Infrastructure webpage within the stormwater webpages, to discuss structural BMPs, Low Impact Development (LID) and Green Stormwater Infrastructure (GSI). The webpage provides links to the Eastern Washington LID manual and Spokane Regional Stormwater Manual (SRSM) for reference. Also, a webpage was added that provides information to the public on the Cochran/Downriver Stormwater Management Facilities project which is currently being designed and scheduled to construct in 2022.

The city created three videos specific to stormwater in 2020 that were tailored to provide information on Spokane Stormwater, Hazels Creek and Green Area Maintenance. Links to the videos can be found

at Spokanestormwater.org. The city has contracted a local multi-media vendor to create additional outreach videos that will be broadcast on social media channels and placed on the City's website.

The website will be given an overhaul in 2022 to make it more interactive and to link to pertinent social media channels performing stormwater messaging. The information available on the website will be increased to include the private stormwater inspection program, educational information on stormwater treatment facilities, and best practices to perform source control, among others.

**Presentations:** Various professional and educational groups are interested in learning about the city's stormwater management system and its efforts to prevent and reduce stormwater pollution. Presentations are open to the public to attend, and are anticipated to continue to be provided, as relevant, in the current and upcoming years. Sharp Avenue Permeable Pavement will be presented at PNWCA in 2022.

**Publications:** Integrated Capital Management and Wastewater Management Department personnel co-authored an article in the January 2021 edition of Stormwater Magazine titled Infiltration Avenue. The article showcases The Sharp Avenue permeable pavement study by discussing the integrated approach to design, collaborative efforts with the Gonzaga University, and goes into the data and information collected as part of the study. The Infiltration Avenue article can be found on the Stormwater Magazine webpage**.** The article is still relevant and currently available.

**Gonzaga Senior Project Support:** The Wastewater Management Department is currently supporting a Gonzaga Engineering Senior Student project by providing guidance, access to stormwater infrastructure, and funding for analysis of sample collected for a swale assessment. The GU students are assessing a number of swales in public service in Spokane to determine life cycle functionality. A final presentation of the results will be provide to city Leaders at the end of the school year in 2022, and made available to the public online.

**Hazel's Creek Regional Stormwater Facility and LID Demonstration Site:** In Fall of 2012, construction was completed and the facility began receiving stormwater from properties within a specified up-gradient boundary. The site also contains publicly used walking trails. This system was utilized as an LID educational opportunity, hosting various LID demonstrations throughout the trail system. Visitors can download a brochure from the Public Works & Utilities website and take a self-guided tour. An informational video showcasing Hazels Creek was created in 2020 to reinvigorate curiosity and interest from the public and is provided on the Hazels Creek link at Spokanestormwater.org. In 2021 the city supported science education at Ferris High School by supplying tools and plantings for the students to

establish additional vegetation at the site. The students planted approximately 600 starts of native species of shrubs and bushes, and will measure the success of the starts in 2022. This outreach activity will be evaluated at other high schools for potential to implement.

**Stormwater Permitting Educational Materials:** The city partnered with the Spokane River Forum and Spokane Riverkeeper to develop the guides Understanding Stormwater Permitting in the City of Spokane and City of Spokane Stormwater Compliance Guide These guides addresses stormwater-related building permit requirements; erosion and sediment control, and also references Ecology's stormwater permit requirements. The guides are provided to development contractors during pre-construction meetings, and are also available on the Spokane River Forum stormwater website. These materials have been available for a number of years, and will continue to be available in 2022.

**Stormwater Messaging:** The city's Wastewater Management Department has initiated a contract with Rogue Heart Media to continue to perform stormwater messaging on the Water Wise social media channels with a more stormwater focused subset of outreach. The outreach will provide source control and treatment facility educational information to the public, and will showcase established partnerships with the city and other agencies. The city is partnering with the Spokane River Toxics Task Force and Spokane River Forum with respect to stormwater outreach to ensure that messages will align and be consistent for the public to be able to clearly gain a better understanding of stormwater best practices. Social channel messaging will continue through 2022 and into 2023.


City of Spokane Wastewater Department
SPOKANE STORMWATER

**Fix Car Leaks Don' Drip and Drive Promotion:** The city has partnered with the local community college, and other organizations, for a free auto leaks workshop to help the public learn about their car and make sound choices for our region. Utility billing inserts have been used as a method of advertisement to over 70,000 customers. The free inspection and monetary savings coupon are still valid at participating shops. More detailed information and a list of participating vendors is available at Fixcarleaks.org.


The city is coordinating with other local municipalities to host a Don't Drip and Drive workshop in 2022 with support from Ecology. The workshop is available as part of the Fixcarleaks.com campaign, and will be provided to the community to support source control practices with respect to car fluids. The program will be evaluated to confirm that the rebates are valid and local automotive shop participants continue to be supportive.

**Promotional Campaign:** The city partnered with the Spokane Indians Baseball Club to champion a campaign designed to connect citizens to the Spokane River, educate about stormwater and work begin done to clean up the River, and support local organizations devoted to River protection. Advertisements

included prints, radio, television, billboards, social media, and promotion during live baseball games, and the effort has been dubbed the Redband Rally Campaign, the promotion gets its name from the native Redband Trout. Due to the pandemic the campaign was temporarily suspended during 2020, but has resumed in 2021, and will continue through 2022.

## 2.2 Public Involvement and Participation

### 2.2.1 Public Involvement and Participation Permit Requirements (S5.B.2)

The permit requires the city to provide ongoing opportunities for public involvement and participation such as at public hearings or on advisory panels or committees during rule-making, or other similar activities. Section S5.B.2.a requires the city to implement a program or policy to create opportunities for the public, to provide input during the decision making processes, including development and adoption of all required ordinances and regulatory mechanisms. Also, to provide ongoing opportunities for public involvement through various councils, committees, programs, and activities. In addition, develop and implement a process for consideration of public comments on the SWMP, including required ordinances and regulatory mechanisms.

### 2.2.2 Public Involvement and Participation Opportunities

***Stormwater Management Program Plan***

The city posts this plan on its website at Spokanestormwater.org annually. The public may provide comment on this plan at any time during the year by emailing the Wastewater Department Environmental Analyst at jgeorge@spokane.org. The city solicits online comments on the draft plan from the public for a 30-day period when this plan is posted. After the 30-day period, the city will review the comments and update the plan as applicable, and post the final version of the plan at Spokanestormwater.org.

***Public Participation Opportunities***

Many of the stormwater activities that the city undertakes in order to meet the goal of the permit (i.e. protect water quality) goes through City Council, which as discussed below, inherently provides the public opportunities to participate, and the public participates.

The city provides many opportunities for public involvement and participation in its decision making processes via open City Council; Public Infrastructure, Environment, and Sustainability Committee; and Planning Commission meetings on a weekly basis. Public involvement is a required component of the ordinance process, and involvement of any interested member of the public is encouraged through workshops, open houses and a formal public comment period. Information on how to participate at City Council meetings and meeting agendas are provided on the city's City Council website prior to the occurrence of the meeting. The city publication *The Gazette* publishes the meeting minutes from the City Council, as well as all call for bids, which include stormwater management, infrastructure, and funding issues and projects. Examples of opportunities for public involvement include rate structure discussions, stormwater mitigation grants and projects; stormwater infrastructure improvements; joint planning of the stormwater management plans; and, ordinances creation or revisions, among others, at the Committee level, and at City Council Meetings.

In 2021, notifications were made to affected property owners and to the general public for an ordinance on private post-construction stormwater facilities as follows:

- September 2021 - Planning Commission workshop and hearing
  - 2 public notices published in Spokesman Review
- September 2021 – Public Infrastructure, Environment, and Sustainability Committee
- September 2021 – City of Spokane blog post
- September/October 2021 - Notification letter sent out to all affected properties
- October 2021 - City Council advance briefing, first reading, and final hearing
  - 2 public notices published in Spokesman Review

The City Council process will continue to be followed in 2022 for stormwater related business being conducted to protect water quality. Additionally, the Spokane Municipal Code is currently being reviewed to determine if there are opportunities to modify the code that would add value to the stormwater program, and ultimately the general public. Ordinances may be proposed to City Council in 2022 specific to stormwater management and the city processes necessary to ensure the protection of water quality.

## 2.3 Illicit Discharge Detection & Elimination (IDDE)

### 2.3.1 IDDE Permit Requirements (S5.B.3)

The permit requires the city to implement and enforce a program designed to prevent, detect, characterize, trace, and eliminate illicit connections and illicit discharges into the MS4. Section S5.B.3.a of the permit requires the city to maintain and periodically update a map of the MS4 to include:

- known outfalls and known discharge points,
- receiving waters other than ground,
- areas served by the MS4 that discharge to ground,
- permanent stormwater facilities owned or operated by the Permittee,
- all connections to the MS4 authorized or approved by the Permittee after August 1, 2019,
- all known connections from the MS4 to a privately owned stormwater system, and
- connections between the MS4 owned and operated by the Permittee and other municipalities or public entities.

Section S5.B.3.b of the permit requires the city to effectively prohibit, through ordinance or other regulatory mechanism, non-stormwater discharges into the MS4 to include:

- Implement an ordinance or other regulatory mechanism that prohibits illicit discharges and authorizes enforcement actions, including on private property.
- Implement a compliance strategy that includes informal compliance actions such as public education and technical assistance, as well as the enforcement provisions of the ordinance or other regulatory mechanism.

Section S5.B.3.c of the permit requires the city to implement an ongoing program designed to detect and identify illicit discharges and illicit connections into the Permittee's MS4 to include:

- Procedures for conducting investigations of the Permittee's MS4, including field screening to identify potential sources.
- Procedures for locating priority areas likely to have illicit discharges.

### 2.3.2 Mapping the System (S5.B.3.a)

The first major component of the City's illicit discharge program is mapping the municipal stormwater drainage system. Maintaining an accurate and up-to-date map of the stormwater drainage system enables the City to track and locate the source(s) of suspected illicit discharges. The Permit outlines minimum information that should be included in the City's municipal storm sewer system map:

- Location of all known municipal storm sewer outfalls, receiving waters, and structural BMPs owned, operated, or maintained by the City;
- Location of all known outfalls and known discharge points,
- Receiving waters,
- Areas served by the MS4 that discharge to ground,
- Permanent stormwater facilities owned or operated by the Permittee,
- All connections to the MS4 authorized or approved by the Permittee
- All known connections from the MS4 to a privately owned stormwater system, and
- Connections between the MS4 owned and operated by the Permittee and other municipalities or public entities.

The Wastewater Management Department completed a map of the stormwater MS4 utilizing the Global Information System (GIS) by Esri computer software program. GIS layers are updated periodically to reflect changes to the system and any additional information.

### 2.3.3 IDDE Ordinance (S5.B.3.b)

The City adopted Ordinance ORD C34564 Section 17. Section 17D.060.190 addresses illicit discharges in accordance with requirements in the Permit. The ordinance defines allowable discharges to the MS4, unlawful discharges, and enforcement actions. The ordinance is available on the Spokane Municipal Code website.

### 2.3.4 IDDE Program (S5.B.3.c)

The Wastewater Management department currently incorporates illicit discharge field inspections with routine maintenance activities. Stormwater crews inspect all inlets to the MS4, including green stormwater infrastructure and stormwater treatment facilities. The stormwater assets are inspected for illicit discharges on a recurring frequency while performing inspections to determine maintenance needs on the assets. The city responds to illicit discharge reports to 311 and 625-7999, Environmental Report Tracking System (ERTS) complaints submitted to Ecology that Ecology notifies the city of, and opportunities that the Spokane Regional Health District identifies while encouraging pollution prevention.

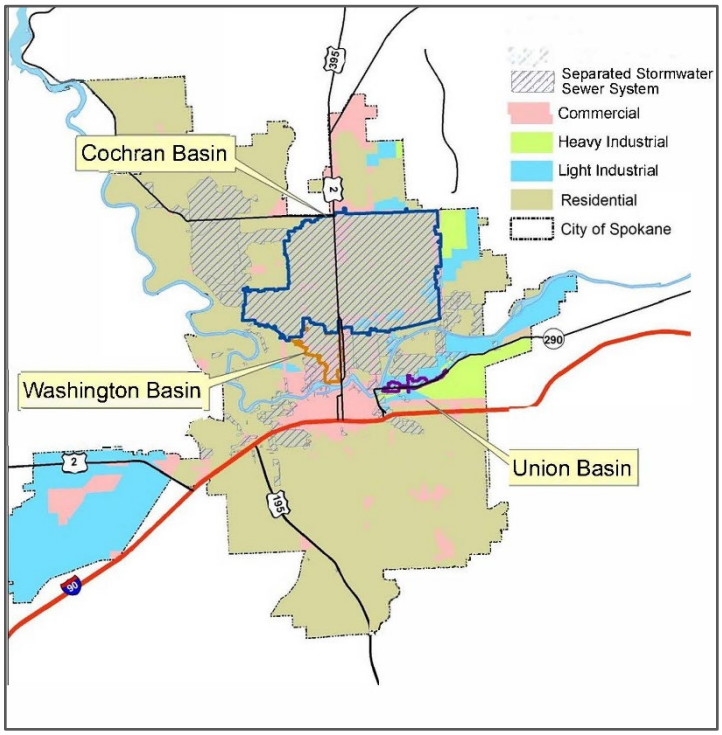
#### *2.3.4.1 Priority Areas*

IDDE priority investigation areas have been defined according to the receiving water body, past illicit discharge complaints, land use and known sources of contamination. The Spokane River flows through

the City, and is the main priority water body. Review of past illicit discharge complaints do not indicate that any one sub-basin within the MS4 had substantially more complaints than another. Figure 2 illustrates a map of zoning and MS4 sub-basins. Industrial zoning areas are assumed to have the greatest potential for storage of large quantities of materials which may potentially produce illicit discharges. Only one stormwater basin within the City, the Union Basin, is located in a heavy industrial area. The Union Basin is located between I-90 and the Spokane River, east of the Hamilton Street Bridge as shown in Figure 2, and is located in heavy industrial and light industrial zoned areas.

PCBs from unknown ubiquitous sources are a contaminant of concern in the Spokane River and may contribute to illicit discharges. The city has performed extensive investigative efforts to obtain environmental PCB information. The Wastewater PCBs - City of Spokane, Washington (spokanecity.org) website details the city's approach to PCBs. Stormwater and catch basin sediments throughout in the Union Basin were sampled for PCBs in 2009, and remedial maintenance was performed on each catch basin after sampling. This effort was part of a larger study that also sampled catch basins in other MS4 sub-basins throughout the City, and detailed sampling and analysis report information is available on the City's website.

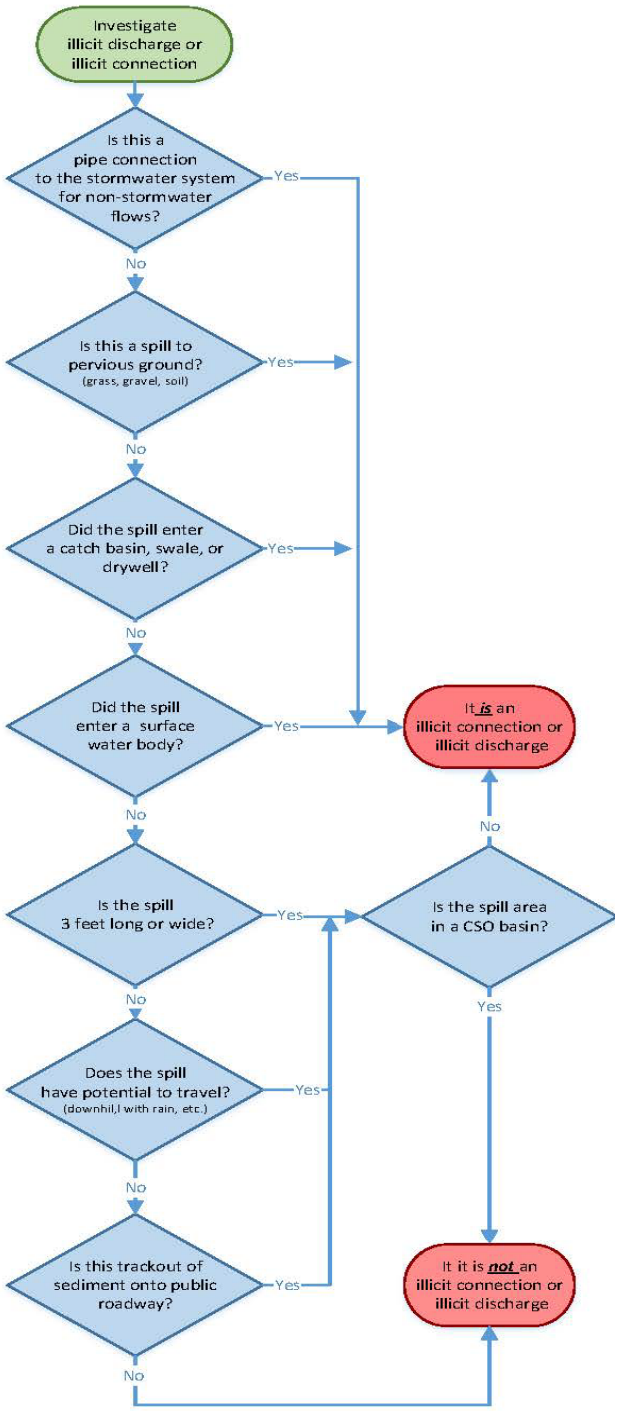
**Figure 3. Map of zoning and MS4 sub-basins.**



The City's illicit discharge potential investigation efforts include the Cochran and Washington stormwater basins. The Cochran stormwater basin is the largest basin in the City, encompassing nearly 5,300 acres of primarily residential area with relatively smaller areas of commercial and light industrial land use. The Cochran basin is considered to have 'typical' stormwater pollutant concentrations for the City, and a project currently underway to pull stormwater flows for the Type IIA design storm offline and send to treatment in three separate green stormwater infrastructure locations. The Cochran Basin project will continue through 2022, and is anticipated to be completed in 2023.

The Washington stormwater basin, whose outfall is on the north end of the Washington Street Bridge, is a much smaller stormwater basin (about 450 acres), where land use is predominantly commercial. Stormwater has been taken offline as project opportunities have risen, and a project that will install emerging stormwater treatment technologies will be implemented in 2022 that will take additional Washington Basin stormwater offline.

**Figure 4. IDDE Decision Tree**




### *2.3.4.2 Field Inspections, Characterizing and Tracing Illicit Discharge*

Most illicit discharge investigations are initiated when the city receives a call on the Illicit Discharge Hotline (625-7999), the MySpokane 311 hotline, or the Wastewater Management primary phone number (625-7900). The Illicit Discharge Hotline is publicized on storm drain markers throughout the City, on the wastewater management website, in brochures, and in booklets handed out at public events. A call to the hotline is routed to one of the Wastewater Management Stormwater Inspectors, who inspects and reports the Wastewater Management maintains a protocol for investigating stormwater complaints and keeping records. In addition to the stormwater hotline, Wastewater Management staff continually checks for illicit discharges as a part of normal day-to-day operations of stormwater asset maintenance. Staff and maintenance crews frequently en route to job sites throughout the City report any noticed illicit discharges to the Stormwater Inspectors. In many cases, the staff and maintenance crews inform the public about proper disposal and appropriate BMPs at the time of seeing the

illicit discharge. Figure 3 is a decision tree  procedural aid for determining if a released material is a reportable illicit discharge.  The illicit discharge program is ongoing and will continue in 2022.

#### *2.3.4.2 Eliminating Illicit Discharges*

**Curb Markers**

Curb markers were installed on all catch basin inlets throughout the basin groups and the locations recorded during the sediment sampling process.  Markers were not placed on sumps located in the middle of the street.  After markers were installed, a larger effort was undertaken throughout the city. Areas with high pedestrian traffic, downtown, and around schools were targeted first.  Installation of curb markers are now incorporated into regular maintenance activities throughout the City and will continue.

**Spokane River Regional Toxics Task Force**

The city is currently a contributing member of the Spokane River Toxics Task Force (SRTTF), which has a large focus on PCBs in our region.  The city will continue to be a contributing member of the SRTTF.  Additionally, the city is partnering with the SRTTF to develop stormwater messaging to the general public. The city is providing support to the task force and Ecology by providing access and coordinating sampling in the Union Basin and Mission Reach areas.

**EnviroStars Waste Directory**

The Spokane River Forum administers the EnviroStars program in Spokane, a small business certification program to provide assistance and incentives for reducing hazardous materials and waste.  Businesses and households can use this resource to understand their waste and learn how to properly dispose of it. The city is a member of the forum, and is currently partnering with the forum to develop stormwater messaging for 2022 that aligns with the city's outreach for illicit discharge elimination.

## 2.4 Construction Site Stormwater Runoff Control

### 2.4.1 Construction Site Stormwater Runoff Control Permit Requirements

Section S5.B.4 of the permit requires the city to implement and enforce a program to reduce pollutants in any stormwater runoff to the MS4 from construction activities.

Section S5.B.4.a requires the city to implement an ordinance by December 31, 2022 that applies to construction sites disturbing one acre or more, and to construction projects of less than one acre that are part of a larger common plan of development or sale.

The ordinance shall include:

- Provisions to review site plans,
- Provisions to inspect sites with high potential for sediment transport prior to clearing or grading,
- Provision for access by qualified personnel to inspect construction-phase stormwater BMPs on private properties that discharge to the MS4, and
- Sanctions to ensure compliance with escalating enforcement procedures and actions.

The ordinance shall require:

- Erosion and Sediment Controls, among others, at new development and redevelopment projects,
- Construction operators to:
    - Adhere to the Core Elements, which include preparation of Construction Stormwater Pollution Prevention Plans,
    - Implement appropriate erosion and sediment control BMPs, and
    - Control waste materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site.

Section S5.B.4.b requires the city to implement procedures for site plan review which incorporates consideration of potential water quality impacts.

Section S5.B.4.c requires the city to implement procedures for site inspection and enforcement of construction stormwater pollution control measures prior to clearing and grading for high potential sites, and during construction to verify proper installation and maintenance of required erosion and sediment controls.

Section S5.B.4.d requires the city to ensure that all staff who are implementing construction stormwater program are trained accordingly.

Section S5.B.4.e requires the city to provide information to construction site operators about available training opportunities.

Section S5.B.4.f requires the city to keep records of all projects disturbing one acre or more, and all projects of any size that are part of a common plan of development or sale that is one acre or more.

### 2.4.2 Construction Site Stormwater Runoff Control Introduction

The *Spokane Regional Stormwater Manual (SRSM)* was developed in joint cooperation by the Cities of Spokane and Spokane Valley and Spokane County. The manual establishes standards for stormwater design and management to protect water quality, natural drainage systems and down-gradient properties as urban development (and redevelopment) occurs. The permit requires that the city use the BMPs from the Washington State Department of Ecology's *Stormwater Management Manual for Eastern Washington (SWMMEW)*, or another technically equivalent manual approved by Ecology. The SRSM was updated to reflect the 2019 revisions of the SWMMEW and provided to Ecology for approval in 2021. The SRSM will continue to be used in 2022.

### 2.4.3 Construction Site Stormwater Runoff Control Activities

The SRSM outlines Erosion and Sediment Control (ESC) requirements, which are equivalent to Core Element #2, Construction Stormwater Pollution Prevention, in Appendix 1 of the Permit. An ESC plan is a requirement of the construction permit process and is equivalent to the Permit's Construction Stormwater Pollution Prevention Plan (Construction SWPPP). Controlling erosion and preventing sediment and other pollutants from leaving the project site during the construction phase is achievable through implementation and selection of BMPs that are appropriate both to the site and to the season during which construction occurs.

The SRSM highlights four objectives of the ESC Plan:

- Protect existing or proposed stormwater management infrastructure;
- Minimize the impacts of erosion, sedimentation and increased runoff caused by land-disturbing activities on private property, public roads and rights-of-way, and water bodies;
- Protect the health, safety and welfare of the general public;
- Protect water quality.

An ESC Plan is required for land disturbing activities 5,000 square feet or greater and projects identified as special sites of any size. Special sites are defined in SMC 17D.090.080 and may include sites with greater than 10 percent slope, highly erosive soils, slope lengths greater than 300 feet, or disturbance of natural vegetative buffer within 50 feet of a wetland or water body. If an ESC Plan is not required, the proponent would still be responsible to control erosion and sediment during construction.

#### *2.4.3.1 Construction Site Stormwater Runoff Control Ordinance (S5.B.4.a.)*

The ESC Ordinance, available on the Spokane Municipal Code 17D.909 website, was adopted and is relevant documents such as the SRSM and SWMMEW; require drainage plans and submittals, maintenance and performance standards in compliance with the Permit.

#### *2.4.3.2 Procedures for Site Plan Review (S5.B.4.b.)*

Erosion and sediment control (ESC) plans are reviewed by the Development Services Center to ensure the proposed controls prevent erosion and keep pollutants from leaving the project site during construction. Commercial application submittal requirements are available on the City's website. An ESC Plan is required as one of the minimum site plan elements.

#### *2.4.3.3 Site Inspection and Enforcement (S5.B.4.c.)*

Inspectors and field engineers from the Development Services Center inspect privately constructed infrastructure. The City of Spokane also has two stormwater inspectors located at the Wastewater Management Department who inspect development sites during construction and when illicit discharge calls are received by the general public. Engineering Services provides construction oversight for public capital improvement projects on City-owned land. The Engineering Services inspectors verify proper installation and maintenance of required erosion and sediment controls for NPDES Construction Stormwater General permitted development sites and capital improvement projects prior to clearing and grading for construction if a high potential for sediment transport is determined, and during construction.

Records of inspections and enforcement actions by Wastewater Management staff are maintained concurrently with the Illicit Discharge program. Many of the erosion and sediment control violations, such as track-off of sediments from the construction site to the street, are considered illicit discharges. These are logged in a database (Complaint Tracker) and on employee time sheets. WWM also maintains records of inspection reports and notices of violations.

Records of inspections and enforcement actions completed by Engineering Services and the Development Services Center are maintained in daily inspection logs as well as digitally in the Accela computer software program.

#### *2.4.3.4 Training and Informational Materials (S5.B.4.d.)*

Informational materials regarding erosion and sediment control are available to construction site operators, design professionals, and other members of the public in the Development Services Center lobby at City Hall. In addition to highlighting erosion and sediment control requirements, brochures direct the target audience to the SRSM. The SRSM details erosion and sediment control requirements equivalent to Appendix 1 of the Permit and BMPs in Department of Ecology's SWMMEW.

## 2.5 Post-Construction Stormwater Management

Section S5.B.5 of the permit requires the city to implement a program to address post-construction stormwater runoff for development and redevelopment projects to ensure that controls are in place to prevent or minimize water quality impacts.

Section S5.B.5.a requires the city to implement an ordinance by December 31, 2022 that requires post-construction stormwater controls for development and redevelopment projects that disturb one acre or more or, are less than one acre and are part of a larger common plan of development or sale. The ordinance must include mechanisms to ensure compliance, and require projects to adhere to the Core Elements. The ordinance must also include requirements to ensure adequate ongoing long-term operation and maintenance of the constructed BMPs.

Section S5.B.5.b requires that the ordinance or other regulatory mechanism include provisions for both construction-phase and post-construction access for the city to inspect stormwater facilities and BMPs on private properties that discharge to the MS4.

Section S5.B.5.b.ii of the permit details that the ordinance should require development and redevelopment projects to adhere to the Core Elements and encourage Low Impact Development of green stormwater infrastructure.

Section S5.B.5.b.ii(c) of the permit requires the ordinance to include requirements to ensure adequate long-term operation and maintenance of the BMPs occurs.

Section S5.B.5.b.iii of the permit requires that the ordinance include provisions for both construction-phase and post-construction access for the city to inspect stormwater BMPs on private properties that discharge to the MS4. In lieu of requiring post-construction access to private properties for city inspectors in perpetuity, Section S5.B.5.b.iii allows for the city to require annual certifications of stormwater facilities by a qualified third party to meet the conditions of S5.B.5.b.ii(c) of the permit.

Section S5.B.5.b.iv of the permit requires that the ordinance include enforcement procedures with the ability to escalate.

Section S5.B.5.b.v of the permit requires the ordinance to include enforce provisions, and for the city to implement an enforcement strategy for the conditions of Section S5.B.5 of the permit.

### 2.5.1 Post-Construction Stormwater Management Permit Requirements (S5.B.5)

- Implement an ordinance that requires post-construction stormwater controls at new development and redevelopment projects.
- Implement procedures for site plan review.
- Implement procedures for site inspection and enforcement of post-construction stormwater control measures.
- Provide training for staff involved in post-construction stormwater management.
- Provide information to design professionals about available training and compliance with BMPs described in the Spokane Regional Stormwater Manual.
- Establish record-keeping methods.

### 2.5.2 Post Construction Stormwater Management Permit Introduction

This section identifies post-construction stormwater requirements, including adoption of the Stormwater Facilities Ordinance, site plan review, site inspection and enforcement of control measures, training, and record keeping. The SRSM, introduced in section 2.4, is used to implement the post-construction stormwater runoff program. The Manual meets or exceeds applicable criteria from the Washington State Department of Ecology's SWMMEW.

### 2.5.3 Post-Construction Stormwater Management Activities

The SRSM outlines the post-construction stormwater program. Chapter 2, Basic Requirements, defines the eight basic requirements for stormwater management for new development and redevelopment projects. Within the City, the threshold for requiring compliance with the Basic Requirements is the "addition or replacement of any impervious surfaces."
Basic Requirements include:

No. 1 – Drainage Submittal;
No. 2 – Geotechnical Site Characterization;
No. 3 – Water Quality Treatment;
No. 4 – Flow Control;
No. 5 – Natural and Constructed Conveyance Systems;
No. 6 – Erosion and Sediment Control;
No. 7 – Source Control; and
No. 8 – Operation and Maintenance.

The Stormwater Site Plan referenced in the municipal stormwater permit (S5.B.5.b) is analogous to the Drainage Submittal in the SRSM (2.2.1 Basic Requirement No. 1). A Concept Drainage Report, a requirement of a Drainage Submittal, is generally required for large projects or those located in environmentally sensitive areas to preliminarily assess drainage requirements and potential impacts. A Drainage Report, another requirement of a Drainage Submittal, is required for most projects and is used to identify drainage impacts from the project as well as determine necessary stormwater runoff treatment and controls. The Drainage Report also assesses operation and maintenance requirements, inspection requirements, and erosion and sediment control.

#### *2.5.3.1 Post-Construction Stormwater Facilities Ordinance (S5.B.5.a.)*

The Stormwater Facilities Ordinance, SMC Chapter 17D.060, was adopted and effective in March of 2010. The ordinance references relevant design documents such as the SRSM and the City of Spokane design standards and specifications, enforcement authority, runoff and infiltration controls, and natural location of drainage requirements.

#### *2.5.3.2 Procedures for Site Plan Review (S5.B.5.c.)*

Drainage submittals are reviewed by the Planning department for code requirements such as critical areas of management, buffers, impervious area creation, building and landscape design and building setbacks. Then, Development Services Center reviews Drainage Submittals for civil plan requirements as described in City Engineering Design Standards and the SRSM.
Engineering Services reviews plans for City Capital Improvement Projects and stormwater plans for the public right-of-way to ensure consistency with Design Standards.
The Development Services Center reviews and approves drainage submittals for private commercial and residential developments. A Stormwater Intake Checklist was added to the City's Engineering Services website to ease the review process. The drainage submittal requires a Drainage Report, Drainage Plan, Grading Plan, Swale Details, and Erosion and Sediment Control Plans and Details. The City requires

developers to submit a maintenance plan for all facilities during the plan review. A draft copy of the Conditions, Covenants and Restrictions (CC&Rs) for the homeowners' association in charge of operating and maintaining the drainage facilities is required.

The developer must address any comments resulting from City staff review and submit revised plans to the City. After confirming that staff comments have been adequately addressed, the Development Services Center will send the developer a letter accepting the design and permitting construction.

#### *2.5.3.3 Site Inspection and Enforcement (S5.B.5.d.)*

There are three inspectors and a field engineer from the Development Services Center who inspect privately constructed infrastructure. Two stormwater inspectors from the Wastewater Management Department inspect privately constructed stormwater controls. Engineering Services provides construction oversight for public capital improvement projects on City-owned land.

Private development sites are inspected during installation and upon completion of construction. If there are deficiencies, a punch list is created by the Engineering Services inspectors to be completed by the developer. Final acceptance does not occur until all deficiencies have been remedied.

#### *2.5.3.4 Training for Staff and Professionals (S5.B.5.d., S5.B.5.e.)*

The Development Services Center is responsible for providing information to construction site operators and design professionals about training available regarding how to (1) install and maintain effective erosion and sediment controls, (2) comply with the requirements of Appendix 1 of the Permit and (3) apply the BMPs described in the SRSM. Copies of information provided to construction site operators are kept. If information is distributed to a large number of design professionals at once, the dates of the mailings and lists of recipients should also be kept.

Staff and professional training is provided for employees and design professionals to aid in reaching water quality goals, ensure permit compliance, and reduce pollution to stormwater runoff. Five training modules were developed, including NPDES Overview, Operations and Maintenance, Facility Inspections, Site Plan Review, and Illicit Discharge. Training was provided for LID and records should be kept including training materials, the date of training, and attendees.

#### *2.5.3.5 Eastern Washington LID Guidance Manual*

The Eastern Washington Low Impact Development (LID) Guidance Manual was adopted as a supplemental guidance for the design, construction, and maintenance of LID stormwater best management practices. The manual was a regional effort led by Spokane County in conjunction with many Eastern Washington municipalities, including the City of Spokane, the Washington Stormwater Center, Department of Ecology, and regional LID experts. It builds on the practices of stormwater pollution prevention, flow control, and treatment, promoting the use of natural features and managing stormwater as close to where it falls as possible. The guidance manual is available on the City's website. The City of Spokane adopted this manual in the Spokane Municipal Code (SMC 17D.060.300). LID remains optional in Eastern Washington, but is encouraged in the City in part by the adoption of this manual. It provides an understanding of LID practices applicable in Eastern Washington and design guidance that both developers and City review engineers can follow.

## 2.6 Pollution Prevention & Good Housekeeping for Municipal Operations

Section S5.B6 of the permit requires the city to implement an operation and maintenance program with the goal of preventing or reducing pollutant runoff from municipal operations.

Section S5.B.6.a of the permit requires the city to develop an Operation and Maintenance (O&M) Plan that details a schedule of the city's Operation and Maintenance activities by December 31, 2022. The O&M Plan must include BMPs that will reduce the discharge of pollutants and protect water quality.

Section S5.B6.a.i of the permit details that the O&M Plan must include appropriate pollution prevention procedures for the following types of facilities and/or activities that must be implemented by the city:

- Inspections and cleaning of stormwater collection and conveyance system assets to include♠:
  - Catch basins
  - Stormwater sewer pipes
  - Open channels
  - Culverts
  - Structural stormwater treatment
  - Structural stormwater treatment flow control facilities

  Notes: ♠ Waste materials generated must be properly managed, and adequate records kept of all cleaning inspection, and disposal activities.

- Maintenance of roads, highways, and parking lots owned or operated by the city that are pollutant generating impervious surface ≥ 5,000 square feet to include:
  - Street cleaning
  - Deicing
  - Snow removal
  - Managing runoff from snow storage areas
  - Managing material storage areas (e.g. salt, sand, or other chemical storage)
  - All-season BMPs to reduce road and parking lot debris and other pollutants

- Management of fleet vehicles fleets to include♣:
  - Storage
  - Washing
  - Maintenance
  - Repair
  - Fueling

Notes: ♣All vehicle and equipment washing and maintenance must be performed in a self-contained covered building, or in designated wash and/or maintenance area that separates wash water from stormwater.

- Maintenance and pollution prevention activities for municipal buildings owned and/or operated by the city to include:
  - Cleaning
  - Washing
  - Painting
  - Other maintenance activities

- Maintenance and pollution prevention activities for parks and open spaces to include:
  - Application of fertilizer
  - Application of pesticides, and herbicides
  - Pet waste BMPs
  - Sediment and erosion control BMPs
  - BMPs for landscape maintenance and vegetation disposal
  - Trash and dumpster management
  - Building exterior cleaning and maintenance BMPs

- Implementing construction projects owned or operated by the city to include:
  - Adhering to the Construction Stormwater General Permit
  - Adhering to the construction and post-construction controls detailed in the Core Elements

- Implementing industrial activities owned or operated by the city to include:
  - Adhering to the conditions of the Industrial Stormwater General Permit

- Implementing and updating Stormwater Pollution Prevention Plans (SWPPPs) for material storage areas, heavy equipment storage areas, and maintenance owned or operated by the city to include♥:
  - Site map showing the facility's stormwater drainage, discharge points, and potential pollutant areas
  - Inventory of the materials and equipment stored on-site, and the activities conducted at the facility which may be exposed to precipitation or runoff
  - Spill prevention and mitigation plan for illicit discharges
  - Description and schedule of facility BMPs (operational and structural)♦
  - Annual inspections of the facility to evaluate the effectiveness of the BMPs, identify maintenance needs, and determine if additional or different BMPs are needed.
  - Record keeping of inspection results (report or checklist)

Notes: ♥ Unless required to have coverage under the Industrial Stormwater General Permit.

♦ BMPs shall be consistent with the Stormwater Management Manual for Eastern Washington, or other Ecology-approved technical manual.

- Implementation of flood management projects to include:
  - Controls that minimize impacts to site hydrology

- Implementation of BMPs at other facilities to include:
  - Protection of water quality

Section S5.B6.a.ii of the permit requires the O&M Plan to include schedule of inspections and requirements for recordkeeping pursuant to permit Section S9 – Reporting and Record Keeping. The schedule of inspections must include:

- Requirement to inspect a minimum of 95% of all known stormwater treatment and flow control facilities (except catch basins) owned, operated, or maintained by the city shall be inspected at least once every two years. Problem facilities identified during inspections should be inspected more frequently.
- Requirement to inspect all catch basins and inlets owned or operated by the city every two years. Catch basins should be cleaned as needed in accordance with permit section S5.B.6.a.
- Requirement to conduct spot of stormwater treatment and flow control facilities after major storm events for damage. Maintenance and repairs should be performed as soon as practicable.

Section S5.B6.a.iii of the permit requires the city to identify the responsible departments or roles for performing each activity in the O&M Plan.

Section S5.B6.a.iii of the permit requires that all city employees with primary construction, operations, or maintenance job functions that are likely to impact stormwater quality to have training that addresses trained: protection of water quality, operation and maintenance requirements, relevant SWPPPs, inspection procedures, and pollution prevention methods to use during job activities.

### 2.6.1 Municipal Operations and Maintenance (S5.B.6)

- Implement Operations and Maintenance (O&M) Plans for municipally-owned facilities. The O&M Plan shall include appropriate pollution prevention and good housekeeping procedures for the following facilities and/or activities:
  - Stormwater collection and conveyance system
  - Roads, highways and parking lots
  - Vehicle fleets
  - Municipal buildings

- Parks and open space
- Construction projects
- Industrial activities
- Material storage areas, heavy equipment storage areas and maintenance areas
- Flood management projects
- Other facilities that would reasonably be expected to discharge contaminated runoff

- Provide training for employees who have primary construction, operations or maintenance job functions that are likely to impact stormwater quality

### 2.6.2 Municipal Operations and Maintenance Introduction

An operation and maintenance (O&M) program has been developed and implemented that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations.

### 2.6.3 Municipal Operations and Maintenance Activities

In coordination with each pertinent City department, Wastewater Management developed a Stormwater Pollution Prevention Operations and Maintenance (O&M) Plan. The O&M Plan was updated to include City activities in one comprehensive document. The Wenatchee O&M Plan template, provided by Ecology, was used.

The O&M Plan highlights pollution control, good housekeeping, BMPs and source control measures that are implemented at public facilities. Basic principles of the O&M Plan are shown below. Recordkeeping and inspection requirements as well as responsible departments are listed within the O&M Plan. It's available on the City's website.

#### *2.6.3.1 Stormwater Collection and Conveyance System*

Stormwater treatment and flow control facilities owned by the City were inspected by Wastewater Management at least once during the first Permit cycle. After major storm events, at a minimum for the 10-year recurrence interval, spot checks of these facilities are conducted. The second permit cycle requires that each facility be inspected at least once every two years. Maintenance concerns are reported after each inspection and addressed as necessary.

The MS4, including streets, catch basins, curbs, gutters, ditches, and storm drains, are also inspected by Wastewater Management. Wastewater Management utilizes a database to assist with documenting inspections. The City is divided into four quadrants. Maintenance crews inspect the sewer and stormwater systems in each quadrant until inspection of the system is complete before restarting the process. Catch basins are inspected for proper function, structural stability, and debris buildup. A work order is processed for any required maintenance work. Catch basins on steep hills and in problem flooding areas are inspected twice a year (spring and fall).

Numerous bio-infiltration swales are located throughout the City. Adjacent property owners and Planned Unit Developments (PUDs) are responsible for maintenance of most swales. WWM is responsible for maintenance of a portion of the swales. The swales maintained by WWM are either planted in dry land grass and maintained as needed or planted in turf grass and maintained on a regular schedule. Turf grass is mowed regularly to maintain a height of two to three inches. For curb cut inlets, maintenance crews remove grass, sediment and debris to prevent buildup and clogging of the inlet. Curb cut inlets are inspected as maintenance crews work through their designated quadrants of the City, or if there is flooding problems.

Culverts are inspected on a three-year cycle by the City's Street Department. Wastewater Management staff clean out culvers as needed upon request.

#### *2.6.3.2 Decant Facility*

The City received a grant from the Department of Ecology to construct a Vactor waste decant facility at the Playfair site, located at 2400 E. Ferry, in Spokane, Washington. Waste generated from cleaning catch basins and other stormwater management and treatment facilities are transferred to the decant facility. At the facility, the liquids are decanted from solids. Liquids are conveyed to an evaporation pond, and solids are transported to a lined landfill. Procedures for using the decant facility are incorporated into the O&M Plan and a site Stormwater Pollution Prevention Plan (SWPPP).

#### *2.6.3.3 Roads, Highways and Parking Lots*

The City of Spokane Street Maintenance Division is responsible for cleaning, repairing and performing preventative maintenance on the 2017 lane miles of paved streets and 61 lane miles of gravel streets. Various divisions within the Streets Department are responsible for maintaining the following: street sweeping, leaf pick up, weed control, street markers, asphalt repair, paving and bridge maintenance, de-icing operations and snow removal. Streets equipment is located at the Central Services Center at 901 N. Nelson, and site has a site specific SWPPP.

#### *2.6.3.4 Vehicle Fleets, Heavy Equipment Storage Areas and Maintenance Areas*

The City of Spokane Fleet Services conducts routine vehicle maintenance on City vehicles including heavy equipment. Fleet Services also conducts major vehicle engine maintenance and/or repairs on vehicles. Vehicle maintenance BMPs are followed to prevent stormwater pollution from cleaning solvents, leaking vehicle parts and vehicle fluids.

The City of Spokane Fleet Services stores numerous heavy and small equipment as well as vehicles on impervious areas such as concrete or asphalt. Oils, greases, metals, vehicle fluids and suspend solids can contribute to stormwater pollution. These facilities are considered high-use sites and have oil/water separators installed.

Fleet Services' Central Service Center facility has a covered designated area wash bay for trucks, equipment, and vehicle washing. The wash bay is connected to the sanitary sewer and is equipped with an oil/water separator for pretreatment of wash water. Sewer Maintenance cleans and removes accumulated sediment as needed. BMPs are followed for proper washing and storage of equipment.

SWPPPs have been prepared for facilities with material storage areas, heavy equipment storage areas, and maintenance areas. However, there are no known municipal facilities which discharge runoff to the separated storm sewer system. At this time, we are unaware of any municipal facilities that require industrial stormwater permits.

#### *2.6.3.5 Municipal Buildings*

Facility operations have the potential to pollute stormwater without proper BMP utilization. Measures are taken to control window washing, carpet and floor cleaning, exterior building and rooftop cleaning and maintenance, painting, trash and dumpster management, remodeling and retrofitting, parking lot maintenance, and landscape maintenance.

#### *2.6.3.6 Parks and Open Space*

Pesticides, herbicides, and fertilizers contain pollutants such as nutrients and toxins. City of Spokane Parks Operations only utilizes store-bought products (i.e. Trimec, Tripleshot, Foundation, Speedzone, Roundup®, fertilizers). Small amounts of such products are applied to stormwater facilities in the field for routine maintenance. By law, when applying any Restricted Use Pesticide (RUP), the applicator must be certified. BMPs are utilized to minimize the impact of pesticides, herbicides, and fertilizers.

Landscaping waste can consist of, but is not limited to, leafy and woody debris from clipping, cutting, mowing and other maintenance activities. These materials can accumulate in the storm system and/or discharge into receiving waters. To ensure that these waste materials do not enter the storm drainage system, proper disposal is necessary.

#### *2.6.3.7 Construction Projects*

Municipal construction projects are subject to the same requirements as those projects proposed by private developers. During construction, erosion and sediment controls are used to prevent sediment-laden stormwater from flowing away from the site and into the stormwater collection and conveyance system. Construction NPDES permits are obtained from the Department of Ecology for projects disturbing more than one acre.

#### *2.6.3.8 Staff Training (S5.B.6.b.)*

The City provides training for employees with primary construction, operation, or maintenance job functions likely to impact stormwater quality. Target employees were identified to participate in the training sessions. Training addresses the importance of protecting water quality, the requirements of the Permit, operation and maintenance requirements, inspection procedures, ways to perform job activities to prevent or minimize impacts to water quality, and procedures for reporting such water quality concerns as potential illicit discharges. Follow-up training should be provided as needed to address changes in procedures, methods or staffing.

Training is generally provided in conjunction with other permit training requirements and/or on the job training activities. Records should be kept including training materials, the date of training, and attendees.

## 3.0 TOTAL MAXIMUM DAILY LOAD REQUIREMENTS

Section S7 of the permit requires the city to apply the conditions of the Total Maximum Daily Limit (TMDL) applied to the Spokane River and Lake Spokane (Long Lake), which are detailed in Appendix of the permit. Appendix 2 of the permit states that the city must:

- Continue to monitor Cochran Basin for phosphorus, ammonia, CBOD, and flow rates in accordance with the Cochran Basin DO TMDL Stormwater Sampling Quality Assurance Project Plan (April 2016).
- Continue to implement the monitoring program throughout the duration of the Eastern Washington Phase II Permit issued on August 1, 2019, and expires on July 31, 2024.
- Enter the results of monitoring for each calendar year into Ecology's EIM database by January 31st of the following year.
- Evaluate and report the results of the monitoring program on an annual basis with respect the city's share of the stormwater Waste Load Allocations in the TMDL.

## 3.1 TMDL Permit Requirements (S7)

Section S7 applies for jurisdictions with applicable Total Maximum Daily Load (TMDL) approved for stormwater discharges from MS4s as listed in Appendix 2 of the permit. Appendix 2 of the permit states the City of Spokane, within the area under its jurisdiction, shall:

- Continue to implement the Appendix 2 TMDL monitoring program that was developed during the August 1, 2014, to July 31, 2019, Eastern Washington Phase II Municipal Stormwater Permit cycle for the Cochrane Basin. Stormwater shall be monitored for phosphorus, ammonia, CBOD, and flow rates. Monitoring shall be conducted shall be conducted according to the Cochran Basin DO TMDL Stormwater Sampling Quality Assurance Project Plan (April 2016).
- The City of Spokane shall continue to implement the monitoring program throughout the duration of the Eastern Washington Phase II Permit issued on August 1, 2019, and expires on July 31, 2024.
- The results of the monitoring for each calendar year shall be entered into Ecology's EIM database by January 31st of the following year.
- The City of Spokane shall evaluate and report the results of the monitoring program on an annual basis with respect the City of Spokane's share of the stormwater Waste Load Allocations in the TMDL

## 3.2 TMDL Activities

Stormwater from the Cochran Basin in the northwest portion of the City of Spokane was monitored from 2016 – 2019. Continuous flow rates were recorded, and analyses was performed on stormwater samples for temperature, pH, total suspended solids (TSS), carbonaceous biological oxygen demand (CBOD), phosphorus, ammonia, and polychlorinated biphenyls (PCBs). The City submitted the Cochran Basin

Dissolved Oxygen (DO) TMDL Stormwater Monitoring Report to Ecology in June 2020, which presented the monitoring results for the basin for the years 2016 – 2019 in accordance with Appendix 2 of the permit.

The monitoring data indicated that the City exceeded the assumptive modeled Waste Load Allocations in 2016 and 2017 for CBOD, and 2019 for ammonia. Given the WLA exceedances, the Stormwater TMDL Waste Load Reduction Action Plan was submitted to Ecology on August 6, 2020, which detailed the construction of stormwater infrastructure that will ultimately eliminate discharges from Cochran Basin into the river for storms up to the size of the6-month design storm. In support of treatment for Cochran Basin stormwater runoff, the City evaluated treatment facility design options at properties near or within the basin. The evaluation determined that the preferred design option would be to construct three separate treatment facilities near the current Cochran Basin stormwater outfall. The three bioretention facility locations will be at TJ Meenach Drive and Northwest Boulevard, the Disc Golf Course at Downriver, and the Boat Launch facility near the TJ Meenach Bridge. Flows to each facility will be managed from a single common flow control vault in Cochran Street between Cleveland and Grace Avenues. The flow control vault will distribute prescribed flows to each of the facilities, and will bypass flows in excess of the 6-month design storm to the existing outfall which discharges to the Spokane River.

Monitoring continued to be conducted in 2020 in accordance with the protocols established in the Cochran Basin DO TMDL Stormwater Sampling Quality Assurance Project Plan (QAPP). Six qualifying storm events were monitored and sampled for phosphorus, ammonia, CBOD, and flow rates, among other parameters, in 2020. Monitoring for phosphorus, ammonia, CBOD, and flow rates, among others, will continue to be conducted in accordance with the QAPP through the end of the permit cycle in July 2024. Monitoring results were tabulated and uploaded into Ecology's Environmental Information Management (EIM) database for the year 2020 data.

Upon receipt of comments back from Ecology on the Cochran Basin Dissolved Oxygen TMDL Stormwater Monitoring Report, the City will evaluate and create a report of the results of the annual monitoring performed in 2020.

## 4.0 MONITORING AND ASSESSMENT

Section S8 of the permit requires the city perform and/or participate in effectiveness studies. Section S8.A.1 requires the city to continue to implement the effectiveness studies that are ongoing from 2014-2019 permit cycle in accordance with the applicable Quality Assurance Project Plan (QAPP).

Section S8.A.2 of the permit requires the city to plan and begin an additional effectiveness study, and encourages collaboration with other municipalities.

Section S8.A.2.a requires the city to:

- Participate in an effectiveness study by serving as the Lead Entity, contributing staff time or other in-kind services, and/or providing funding,

- Submit to Ecology a brief description of the study, with a list of project participants and each participant's associated role(s) in the study, on or before June 30, 2021,
- Submit a detailed study design proposal to Ecology on or before September 30, 2022 following the instructions in *Eastern Washington Stormwater Effectiveness Studies, Detailed Study Design Proposal & QAPP* template (July, 1, 2019, v.1),
- Submit a completed QAPP on or before July 31, 2023,
- Begin to conduct the study on or before December 1, 2023, or within three months of receiving Ecology's approval of the QAPP (whichever is later), and
- Include effectiveness study activities (e.g. assigned duties; participation in meetings, proposal development, project reviews; and study implementation) in the Permittee's updated SWMP.

Section S8.B.2.1 of the permit requires the city to follow the reporting requirements and timelines in the approved QAPP for the study, including:

- Entering all applicable data collected for the study into Ecology's Environmental Information Management (EIM) database.
- Publishing a final report within 60 days with the results of the study and recommended future actions based on the findings.
- Producing a fact sheet summarizing the findings and recommendations with 90 days of completing the study and sharing it with other Permittees. The target audience for the fact sheet is stormwater managers and local government elected officials.

Section S8.B.2.2 of the permit requires the city to track assigned duties and record participation in effectiveness study meetings, proposal development, project reviews, and study implementation, and include a summary in the Permittee's Annual Report.

## 4.1 Monitoring and Assessment Permit Requirements (S8)

- Continue to participate in implementation of the Ecology-approved studies pursuant to *Eastern Washington Phase II Municipal Stormwater Permit (2014-2019)*.
- Coordinate with other Permittees in your Urban Area to plan and begin an additional Stormwater Management Program effectiveness study. Submit to Ecology a detailed study design proposal.
- Submit a completed QAPP to Ecology.
- Enter all applicable data collected as part of conducting the study into Ecology's Environmental Information Management (EIM) database.
- Within 60 days of completing the study, publish a final report with the results of the study and recommended future actions based on the findings.

## 4.2 Eastern Washington Effectiveness Studies

Each City and County in Eastern Washington was required to participate in preparation of studies to test the effectiveness of stormwater management program components. A total of twelve to fifteen study ideas were submitted to Ecology. Eight to twelve of these studies should be implemented.
The City of Spokane Valley received a grant from Ecology and was coordinating the first phase of this effort. In 2014, permittees developed a long list of potential study ideas and began to refine the list. Potential studies may involve:

- Public education and outreach strategies that provide the most benefit
- Catch basin cleaning and street sweeping effectiveness
- Most beneficial frequency of maintenance practices
- IDDE techniques that provide the most benefit
- Planting options for vegetated swales
- Pollutant loading from various land uses specific to eastern Washington
- Checklists for reporting requirements
- Effective design of BMPs

Two effectiveness studies have been initiated by the City of Spokane: 1) Sharp Avenue Sharp Avenue Permeable Pavement Pollutant Removal Efficacy Study, and 2) Garland Avenue Biochar Amended Storm Garden Pollutant Removal Efficacy Study.

### *4.2.1 Sharp Avenue Sharp Avenue Permeable Pavement Pollutant Removal Efficacy Study*

Permeable pavement in the forms of pervious concrete and porous hot mix asphalt was constructed on Sharp Avenue in order to satisfy the effectiveness studies requirements of Section 8 of the permit. The project was funded in part by Ecology grant WQC-2016-Spokan-000016, and construction was completed in 2018. The intent of permeable pavement is to allow for precipitation and stormwater runoff to infiltrate into the subsurface. Therefore, the location of this study is its own catchment area or drainage basin. This drainage basin includes a portion of a minor arterial with Average Daily Traffic (ADT) count of 7,500 that is surrounded by residential and campus land use. The approach of this study is to collect stormwater infiltrated into the permeable pavements and associated sub-base via underdrains and piping conveyance systems to separate monitoring locations.

Two different types of permeable pavements have been constructed on Sharp Avenue: porous hot mix asphalt (HMA) and pervious concrete. Pervious concrete with associated sub-base materials was constructed on Sharp Avenue between the side streets of Lidgerwood Street and Astor Street, where a liner and underdrain were installed on the south side of Sharp Avenue to collect infiltrated stormwater for sampling. Porous HMA with associate sub-base materials was constructed on Sharp Avenue between the side streets of Addison Street and Dakota Street, where a liner and underdrain were installed on the south side of Sharp Avenue between Addison Street and Standard Street to collect infiltrated stormwater for sampling. In order to collect a background stormwater sample to determine the efficacy of pollutant removal by the permeable pavements, catch basins and conveyance piping were installed to the west of the permeable pavement areas in order to collect un-infiltrated stormwater runoff.

A Quality Assurance Program Plan detailing the monitoring to be conducted was submitted to Ecology and approved in 2019. Monitoring began in 2019 and will be ongoing for 5 consecutive years to include observations of the pavements through the changes in season and in response to maintenance activities such as street sweeping and snow removal. Stormwater sampling at 3 distinct locations began in 2019 and the data continues to be evaluated. Infiltration tests at various locations is being performed before and after certain street sweeping events to monitor changes in the permeability of the pavements after sweeping and over time.

The Sharp Ave effectiveness study was ongoing in 2021. Sampling equipment has been installed in manholes on Sharp Ave. between Pearl St. and Dakota St., and sampling and analysis is performed in accordance with the Ecology approved QAPP, as storm events allow, and sampling will be ongoing through 2024. However, 2021 was a very dry year and there was also equipment malfunctions. Only two qualifying events were sampled in 2021. The equipment has been troubleshot and returned to service and is currently functioning Data will be summarized at the end of the study in the year 2024 and published in accordance with the QAPP. The Sharp Avenue project was summarized in an article in Stormwater Magazine in January 2021 and can be found online at Infiltration Avenue | Storm Water (stormh2o.com).

### 4.2.2 Garland Avenue Biochar Amended Storm Garden Pollutant Removal Efficacy Study

Storm gardens were installed on Garland Avenue in order to satisfy the effectiveness studies requirements of Section 8 of the permit. The City of Spokane and University of Idaho funded a laboratory research study to develop a soil/biochar design mix for application in the storm gardens. The study used bench-scale laboratory testing of two different types of biochar available in the Spokane Region: 1) wood, and 2) Kentucky bluegrass stubble. The laboratory study conducted at Gonzaga University included bench scale laboratory testing to identify a soil mixture for field application. Results from the study determined that the wood biochar with loamy sand (and no other additives) removed the most pollutants. As a result, it was selected for use in the storm garden field application phase.

The goal of this study is to measure the percent reduction of monitored pollutant concentrations between the influent and effluent at the storm garden. To achieve this, the City will sample the influent (pre-infiltration) and effluent (post-infiltration) stormwater concentrations. Influent sample concentrations will be measured prior to infiltration, and effluent sample concentrations will be measured after infiltration through the storm garden comprised of the amended soil. A Quality Assurance Program Plan detailing the monitoring to be conducted was submitted to Ecology and approved in 2019. Monitoring began in 2019 and will be ongoing for 5 consecutive years to include observations of water quality over time.

The Garland Ave effectiveness study was ongoing in 2021. Sampling equipment has been installed at the corner of Garland Ave and Belt St., and sampling and analysis is performed in accordance with the Ecology approved QAPP, as storm events allow, and sampling will be ongoing through 2024. Data will be summarized at the end of the study in the year 2024 and published in accordance with the QAPP.

### 4.2.3 Additional Effectiveness Study (2019–2024 Permit Cycle)

The City of Spokane, the City of Spokane Valley, and Spokane County have partnered to perform a study that will evaluate the treatment performance of two non-vegetated bioretention soil media (BSM) Best Management Practices in Eastern Washington through the TAPE process. The media tested will include the high performance BSM and the 60 sand: 40 compost (60:40) BSM. A rock mulch will be used to protect the surface from erosion.

Pollutant removal efficacies will be determined from data collected on stormwater pre- and post- swale for each swale co-located in a university parking lot. Dependent on the results, local stormwater management guidelines may be revised and municipal management strategies modified. The study will be implemented by a consultant on behalf of all municipal partners, and the City of Spokane will be the lead entity. The details for this non-vegetated swale study were provided to Ecology in June 2021.

## 5.0 ANNUAL REPORT

Section S9 of the permit requires the city to submit an annual report electronically using Ecology's WQWebPortal program no later than March 31st each year.

Section S9.A requires the city to keep all records related to the permit for at least five years.

Section S9.B requires the city to make all records related to the permit and this SWMP available to the public at reasonable times during business hours, and provide a copy of the most recent Annual Report to any individual or entity, upon request.

Section S9.C of the permit requires the city to include in the following:

- Stormwater Management Program Plan (SWMP Plan),
- Annual Report form describing the status of implementation of the requirements of the permit for the reporting period,
- Attachments to the Annual Report form including summaries, descriptions, reports, and other information, as required or as applicable, to meet the conditions of this Permit during the reporting period.
- Certification and signature of the report by principal executive officer or ranking elected official, and
- Notification of any annexations, incorporations or jurisdictional boundary changes resulting in an increase or decrease in permit coverage during the reporting period.

The city completes the Annual Report and submits by the March 31st deadline on an annual basis. Copies of the annual report can be found on the city 's website at www.Spokanestormwater.org.

## 6.0 ACRONYMS

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|---|---|
| BMP: | Best Management Practice |
| CFR: | Code of Federal Regulation |
| CSO: | Combined Sewer Overflow |
| CWA: | Clean Water Act |
| ESC: | Erosion and Sedimentation Control |
| GIS: | Geographic Information System |
| LID: | Low Impact Development |
| MS4: | Municipal Separate Storm Sewer System |
| NPDES: | National Pollutant Discharge Elimination System |
| O&M: | Operation and Maintenance |
| RCW: | Revised Code of Washington |
| SRSM: | Spokane Regional Stormwater Manual |
| SMC: | Spokane Municipal Code |
| SMP: | Stormwater Management Plan |
| SWMP: | Stormwater Management Program |
| SWPPP: | Stormwater Pollution Prevention Plan |
| TMDL: | Total Maximum Daily Load |
| UIC: | Underground Injection Control |
| WAC: | Washington Administrative Code |

## 7.0 DEFINITIONS

**Best Management Practice:** The utilization of methods, techniques and/or products that have been demonstrated to be the most effective and reliable in minimizing environmental impacts.

**CWA:** The federal Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Pub. L. 92-500, as amended in Pub. L. 95-217, Pub. L. 95-576, pub. L. 96-483, and Pub. L 97-117, 33 U.S.C 1251 *et seq*.

**Development:** Any proposed land use, zoning, or rezoning, comprehensive plan amendment, annexation, subdivision, short subdivision, planned unit development, planned area development, conditional use permit, special use permit, shoreline development permit, or any other property development action permitted or regulated by the Spokane Municipal Code (SMC).

**Discharge (v):** Disposal, injections, dumping, spilling, pumping, emitting, emptying, leaching or placing of any material so that material enters and exits from the MS4 or from any other publicly owned or operated drainage system that convey storm water. The term includes other verb forms where applicable.

**Discharge (n):** Runoff, excluding offsite flows, leaving the proposed development through overland flow, built conveyance systems or infiltration facilities.

**Discharger:** When used in the context of stormwater management and the SMC of 17D.060 and 17D.090, means any person who discharges to the City's MS4 or any other publicly owned or operated drainage system that conveys, manages or disposes of stormwater flows.

**Drainage**: (1) The process of removing surplus ground or surface water by artificial means, (2) the manner in which the waters of an area are removed, or (3) the area from which waters are drained; a drainage basin.

**Erosion and Sedimentation Control:** Any temporary or permanent measures taken to reduce erosion, control siltation and sedimentation, and ensure that sediment-laden water does not leave a site.

**Groundwater:** Water in a saturated zone or stratum beneath the surface of the land or below a surface water body.

**Heavy Equipment Maintenance or Storage Yard:** An uncovered area where heavy equipment (e.g. mowers, excavators, dump trucks, backhoes, or bulldozers) is washed or maintained, or where at least five pieces of heavy equipment are stored regularly or on a long term basis.

**Illicit Connection(s):** Any man-made conveyance connected to the municipal separate storm sewer system (MS4 system) in violation of the National Pollutant Discharge Elimination System (NPDES) permit requirements.

**Illicit Discharge:** The introduction or discharge of anything into the municipal separate storm sewer system (MS4 system) in violation of the National Pollutant Discharge Elimination System (NPDES) permit requirements.

**Impervious Surface:** A hard surface area that either prevents or retards the entry of water into the soil mantle. Common impervious surfaces include, but are not limited to, rooftops, walkways, patios,

driveways, parking lots, storage areas, concrete, or surfaces that impede the natural infiltration of stormwater.

**Industrial Activity:** Manufacturing, processing or raw materials storage areas at an industrial plant. These activities may be required to have Department of Ecology's NPDES permit coverage in accordance with 40 CFR 122.26.

**Low Impact Development:** A stormwater management and land development strategy applied at the parcel and/or subdivision scale that emphasizes conservation and use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely mimic pre-development hydrologic conditions.

**Material Storage Facilities:** An uncovered area where bulk materials (liquid, solid, granular, etc.) are stored in piles, barrels, tanks, bins, crates, or other means.

**Municipal Separate Storm Sewer System (MS4):** A conveyance or system of conveyances, including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains, (1) owned or operated by a state, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State Law) having jurisdiction over disposal of wastes, stormwater, or other wastes, including special districts under State Law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States, (2) designed or used for collecting or conveying stormwater, (3) which is not a combined sewer, and (4) which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

**National Pollutant Discharge Elimination System (NPDES):** The national program for issuing, modifying, revoking, and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of the Federal Clean Water Act, for the discharge of pollutants to surface waters of the state from point sources. These permits are referred to as NPDES permits and, in Washington State, are administered by the Washington State Department of Ecology (Ecology).

**NPDES Eastern Washington Phase II Municipal Stormwater Permit (WAR04-6505):** A permit issued to the City of Spokane from the Washington State Department of Ecology, granting authority to discharge stormwater into state surface waters. Permit also addresses water quality issues.

**Outfall:** A point source ad defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the State and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels, or other conveyances which connect segments of the same stream or other waters of the State and are used to convey waters of the State.

**Permittee:** Any Primary Permittee, Co-Permittee, or Secondary Permittee unless specifically stated otherwise for a particular section of permit WAR40-6505.

**Pollutant:** (1) Any substance prohibited or limited by federal, state or local regulations, released or discharged in conjunction with development. (2) Any substance, released or discharged, that causes or contributes to violation of water quality standards.

**Runoff:** Water that travels across the land surface, or laterally through the ground near the land surface, and discharges to water bodies either directly or through a collection and conveyance system, includes stormwater and water that travels across the land surface from other sources.

**Spokane Regional Stormwater Manual:** A technical document establishing standards for stormwater design and management to protect water quality, natural drainage systems, and down-gradient properties as urban development occurs.

**Stormwater:** Any runoff flow occurring during or after any form of natural precipitation, and resulting from such precipitation, including snowmelt. Stormwater further includes any locally accumulating ground or surface waters, even if not directly associated with natural precipitation events, where such waters contribute or have potential to contribute to runoff onto the public right-of-way, public storm or sanitary sewers, or flooding or erosion on public or private property.

**Stormwater Management Program (SWMP):** A set of actions and activities designed to reduce the discharge of pollutants from the regulated small MS4 to the MEP, and to protect water quality; it comprises the components listed in S5 or S6 of permit WAR04-6505 and any additional actions necessary to meet the requirements of applicable TMDLs.

**Total Maximum Daily Load (TMDL):** A water cleanup plan. A TMDL is both a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and non-point sources. The calculation includes a margin of safety to ensure that the water body can be used for its state-designated purposes. The calculation also accounts for seasonable variation in water quality. Water quality standards are set by states, territories, and tribes. They identify the uses for each water body—such as drinking water supply, contact recreation (swimming), and aquatic life support (fishing)—and the scientific criteria to support that use. The Clean Water Act, Section 303, establishes the water quality standards and TMDL programs.

## 8.0 REFERENCES


Brown, E., D. Caraco, and R. Pitt. 2004. *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments*. Center for Watershed Protection, Ellicott City, MD. [http://cfpub.epa.gov/npdes/stormwater/menuofbmps/illicit.cfm]

Casco Bay Estuary Partership (CBEP). *Guidelines and Standard Operating Procedures: For Stormwater Phase II Communities in Maine.* [http://www.cascobay.usm.maine.edu/publications.html].

City of Spokane, City of Spokane Valley, and Spokane County. (2008). *Spokane Regional Stormwater Manual.* http://www.spokanewastewater.org/Docs/Stormwater/Spokane_Regional_Stormwater_Manual.pdf.

Mays, L.W. (Ed.). 2001. *Stormwater collection systems design handbook.* New York: McGraw-Hill.

Washington State Department of Ecology, AHBL, and HDR. (2013). *Eastern Washington Low Impact Development Guidance Manual.*

Washington State Department of Ecology. (2007). *Eastern Washington Phase II Municipal Stormwater Permit.*

Washington State Department of Ecology. (2006). *Guidance for UIC Wells that Manage Stormwater.* Publication No. 05-10-067.

Washington State Department of Ecology. (2008). *Municipal stormwater general permit: Guidance for cities and counties.*

Washington State Department of Ecology. (2004). *Stormwater Management Manual for Eastern Washington.* http://www.ecy.wa.gov/programs/wq/stormwater/tech.html.