



**CITY OF EDGEWOOD
COUNCIL STUDY SESSION AGENDA**

Tues., August 7, 2018 – 7:00 PM ♦ City Hall – 2224 104th Avenue East ♦ Edgewood, WA

1. CALL TO ORDER

Pledge of Allegiance & Roll Call

2. COUNCIL BUSINESS

A. Presentation (no material) - CM Meyers Appreciation/Farewell

B.  Discussion - Development Review

C.  Review/Discussion - Job Description

D. Review/Discussion (no material) - Council Highlight Review

E.  Review/Discussion - SWMP Update

F.  Review/Discussion - Ordinance – Cell Tower Siting – Updating EMC 18.100.110

G.  Review/Discussion - Resolution – Herrera Contract

H. Discussion (no material) - Parks

3. OTHER COUNCIL ITEMS

4. ADJOURN

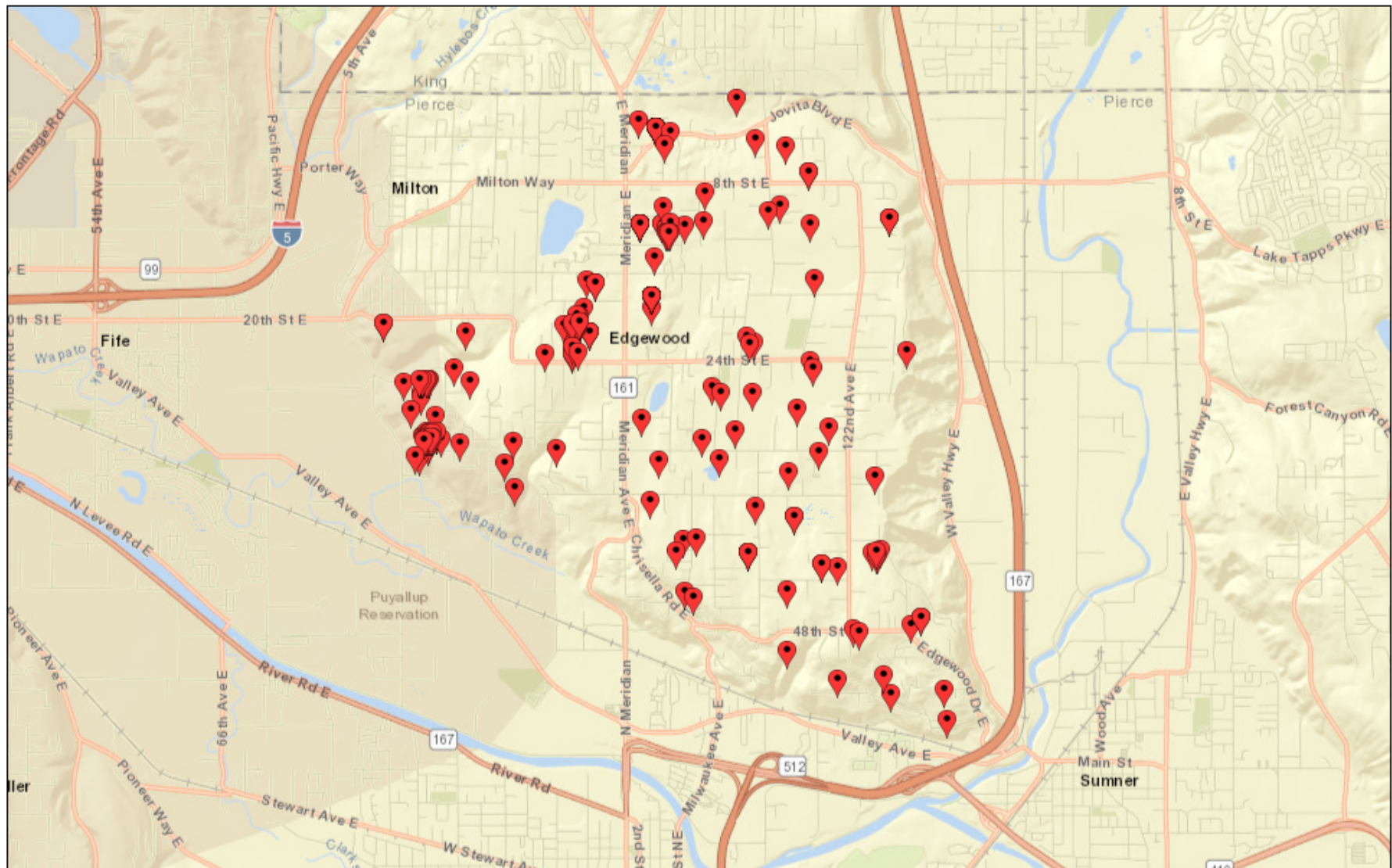
Study Sessions are meetings for Council to review upcoming and pertinent business of the City, no action is taken by the City Council. Study Sessions are open to the public, but public input is reserved for the regular Council meetings



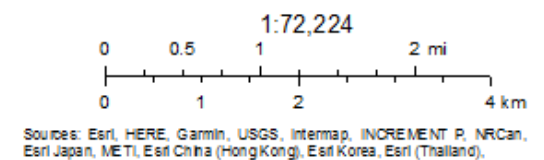
City Of Edgewood Council Agenda Summary Sheet

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SUBJECT: Monthly Update Regarding Community Development Project and Permit Statuses.		Agenda Item #:	2B
		For Agenda of:	August 7, 2018
		Prepared by:	Darren Groth
ATTACHMENTS (list): ☒ Permit and Project Activity Map ☒ Ongoing Land Disturbing Projects ☒ July 2018 Permit Report			
Review of Materials:			
Mayor, Daryl Eidinger	☐	Expenditure Required:	<u>\$0</u>
Asst. City Administrator, Dave Gray	☐	Amount Budgeted:	<u>\$0</u>
City Attorney, Carol Morris	☐	Appropriation Required:	<u>\$0</u>
City Clerk, Rachel Pitzel	☐	Timeline: N/A	
Community Development Director, Darren Groth	☒		
Public Works, Jeremy Metzler	☐	BARS:	
Fiscal Note/Consideration: N/A			
SUMMARY STATEMENT: The City's Community Development Department (CDD) is entrusted by City Council, Edgewood citizens, and the State of Washington to provide growth management and development review, neighborhood preservation and revitalization, property inspection and maintenance, and other programs and business development services necessary to ensure the healthy, safety, and quality of life of Edgewood residents. To carry out these responsibilities, the CDD staff members perform numerous customer interactions, code interpretations, permitting functions, project reviews, on-site inspections, and multiple other functions. Several of these functions are easily presented to demonstrate development activity levels in Edgewood. This monthly agenda item was added to City Council's first Study Session meeting of each month to provide regular updates on land development actions occurring in Edgewood. Each month, the City Council will receive a permit and project activity map that shows a pin for each active permit engaged in some stage of the development process. In addition, a status report will be provided for ongoing land disturbing projects that will give details regarding the various land construction sites around the city. Finally, the included permit report will update the City Council on the permitting activity for the previous month.			
COUNCIL COMMITTEE REVIEW AND RECOMMENDATION: N/A			
RECOMMENDED ACTION: Receive a briefing, hold a discussion, and provide any direction to staff regarding the reporting of community development project and permit statuses.			



August 1, 2018



Ongoing Land Disturbing Projects

File Number	Project Name	General Location	Type	Status	Plan Approval
18-1232	Afichuk SFR	4222 CALDWELL RD E	SFR	PENDING	
18-1012	Abel Short Plat	16th and 122nd	Pre-Plat	PENDING	
18-1248	Johnson SFR	11322 18TH ST E	SFR	PENDING	
18-1259	Maksimchuk Short Plat	24th and 112th	Pre-Plat	PENDING	
18-1263	Taylor Addition	12015 24TH ST E	SFR	PENDING	
18-1264	Pavlovsky Addition	12318 27TH ST E	SFR	PENDING	
18-1266	N. Edgewood Apts Pool & Spa	North Meridian	Site Dev	PENDING	
18-1268	Hall Street Vacation	Jovita trailhead	ROW	PENDING	
18-1269	Caldwell Crest SFR (Lot 4)	125th and Caldwell	SFR	PENDING	
18-1091	Ratsko SFR	3805 122ND AV E	SFR	PENDING	
4532	Northwood Estates	24th near Meridian	Site Dev	PENDING	
4678	The Arbors	Meridian and 20th	Site Dev	PENDING	
16-5623	Haymond C&G	32nd and 110th	SW / Site Dev	DEFICIENT	
18-1040	View Pointe RV Storage	Meridian and 12th	Site Dev	DEFICIENT	
17-1488	The Learning Center	Meridian near Jovita	Site Dev	DEFICIENT	
17-1435	Volente Subdivision	33nd and 87th	Site Dev	DEFICIENT	
18-1130	Heart & Soul SP	9725 18TH STCT E	Pre-Plat	DEFICIENT	
18-1041	Curran Estates	4120 114TH AV E	Final Plat	DEFICIENT	
17-1527	Northwood Estates West	24th near Meridian	Site Dev	DEFICIENT	
18-1218	Volente Early C&G	33nd and 87th	C&G	DEFICIENT	
18-1174	Robinson/Boling Detached Garage	12809 17TH STCT E	SFR	DEFICIENT	
Various	Westridge SFRs (11 permits)	Westridge Subdivision	SFR	Various	
18-1181	Domus Townhomes PRD	11th and 104th	Final Plat	APPROVED	7/10/2018
18-1214	Grubb Short Plat	48th and 122nd	Pre-Plat	APPROVED	7/9/2018
18-1045	Berezniov Short Plat	20th and 90th	Pre-Plat	APPROVED	7/6/2018
18-1203	Kimpel Detached Addition	114th south of 36th	ADU	APPROVED	7/5/2018
18-1129	Ankeman SFR	12017 53RD STCT E	SFR	APPROVED	6/25/2018
17-1532	Yurina-Collins Shared Access	114th south of 36th	C&G	APPROVED	5/30/2018
18-1015	Pascolo Estates	32nd and 116th	Site Dev	APPROVED	5/17/2018
17-1222	Kelley Clear & Grade	35th near 91st	C&G	APPROVED	5/7/2018
17-1472	Gervais Short Plat	16th and 112th	Site Dev	APPROVED	3/30/2018
17-1093	North Edgewood Apartments	North Meridian	Site Dev	APPROVED	3/6/2018
17-1381	Northwood Elementary	24th near Meridian	Site Dev	APPROVED	2/23/2018
17-1246	Caliber SP	106th south of 32nd	Site Dev	APPROVED	2/21/2018
17-1063	Lisitsyn Short Plat	County Line Road	Site Dev	APPROVED	10/17/2017
17-1373	Northwood Estates West	24th near Meridian	C&G	APPROVED	10/9/2017
17-1173	Domus Townhomes PRD	11th and 104th	Site Dev	APPROVED	8/28/2017
16-5695	Edgewood Heights	Meridian and 20th	Site Dev	APPROVED	8/4/2017
17-1098	Maple Grove	28th and 87th	Site Dev	APPROVED	7/31/2017
16-5745	Nicklaus Plat	24th and 94th	Site Dev	APPROVED	6/5/2017
17-1130	Smith C&G (Old #5145)	1119 108TH AV E	SW / Site Dev	APPROVED	4/24/2017

July 2018

Number of Applications Received and Issued

Department	Received	Issued	YTD RECEIVED	YTD ISSUED
# of Building Permits	50	43	248	236
# of Planning Permits	9	6	43	
# of Public Works Permits	19	14	67	40

Inspections Completed

Department	# of Stops Made	# of Inspections	YTD # of Inspections
Public Works Inspections	50	131	896
Building Inspections	163	395	3240

Number of Inspections By Inspector

Inspector	# of Inspections
Dean	20
Gene	18
Cory	357
Taylor	124
Jeremy	7



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SUBJECT: Office Manager Job Description		Agenda Item #:	2C
		For Agenda of:	August 7, 2018
		Prepared by:	Dave Gray
ATTACHMENTS (list): ☒ Office Manager Job Description			
Approval of Materials:			
Mayor, Daryl Eidinger	☒	Expenditure Required:	<u>\$0</u>
Asst. City Administrator, Dave Gray	☒	Amount Budgeted:	<u>\$0</u>
City Attorney, Carol Morris	☐	Appropriation Required:	<u>\$0</u>
City Clerk, Rachel Pitzel	☒	Timeline August 14 th Regular Council Meeting.	
Community Development Director, Darren Groth	☒		
Public Works, Jeremy Metzler	☒		
Fiscal Note/Consideration: Approval of the Job Description does not require a financial commitment. The reason for adding this position will, and will be discussed in financial detail at the time Staff has determined how to fill the Office Manager position on a specific timeline.			
SUMMARY STATEMENT: During a review of the current workload, and the interviewing process to fill the current Plans Examiner/Building Inspector position, staff identified a number of support functions that were not being addressed. These included regular ongoing business cycle tasks such as addressing, grant and project tracking, code enforcement support and tracking, legal document process control, etc. In addition, the position needs identified a strong desire to attach one position to all city project tracking, monitoring and execution status reporting to provide staff, leadership, Mayor and the Council, a comprehensive picture of the City workload. These functions were included in old job descriptions in place prior to the recession layoffs in 2009, where the City maintained 18 full time positions. This position is proposed to be at the same pay scale as the Accounting Manager (Range FT-17-08).			
COUNCIL COMMITTEE REVIEW AND RECOMMENDATION:			
RECOMMENDED ACTION: Request the Mayor bring the Agenda Bill together with the Job Description before Council at the August 14 th regular council meeting, on the Consent Agenda, for Council action. ALTERNATIVES TO RECOMMENDED ACTION: 1) Do not adopt 2) Forward to Study Session for further review			



CITY OF EDGEWOOD

OFFICE MANAGER - Job Description

Department: Administration

Salary Range: \$4,844-\$6,403/mo.

Opening Date:

Closing Date: Open until Filled

This position is a full-time, non-union, FLSA exempt position.

GENERAL SCOPE OF WORK:

The Office Manager is responsible for managing and overseeing the City of Edgewood's day-to-day office activities by providing adequate support to City staff, ensuring high levels of organizational efficiency, and providing effective communication. This position may come in contact with sensitive and confidential information that may be of critical or strategic nature. The Office Manager is responsible for intra-office communication protocols, administrative procedures, inventory control, office staff supervision, project management, and task delegation, and the primary backup for the Permit Coordinator. This position performs a wide range of cross-functional office duties, teaming with all departments at City Hall. Work is often performed independently, with a high degree of discretion; however, the position serves at the direction of the City Clerk.

ESSENTIAL JOB FUNCTIONS:

The duties listed below are intended only as illustrations of the various types of work that may be performed. The omission of specific statements of duties does not exclude them from the position if the work is similar, related, or a logical assignment to the position. Reasonable accommodations may be made to enable performance of these essential functions.

1. Manages office services by ensuring office operations and procedures are organized; correspondence are controlled; filing systems are designed; supply requisitions are reviewed and approved; and that clerical functions are properly assigned and monitored.
2. Maintains office efficiency by carrying out planning and execution of equipment procurement, layouts, and office systems.
3. Develops and implements office policies by setting up procedures and standards to guide the operation of the office; ensures that results are measured against standards, while making necessary changes along the way.
4. Assigns project tasks to other staff members, as necessary, and monitors the performance of each assigned task.
5. Reviews and analyzes special projects and keeps the City's executive team properly informed.
6. Ensures top performance of office staff by providing adequate coaching and guidance.

7. Attends educational workshops, reviews industry publications, joins professional associations, and builds networks with fellow professionals in order to remain updated of technical and professional knowledge and responsibilities.
8. Participates actively in the planning and execution of company events.
9. Develops standards to enhance operational procedures.
10. Manages the City's relationship with the Information Technology (IT) Department to assess equipment needs and deal with issues quickly to return staff and equipment to full operation.
11. Assists with new employment - in processing and initiating benefit enrollment.
12. Partners with the Accounting Manager to assist with mailings, purchase orders, and other necessary accounting tasks.
13. Coordinates schedules, appointments, and leaves of absences.
14. Maintains knowledge of Front Counter tasks and standard operating procedures.

NECESSARY KNOWLEDGE, SKILLS AND ABILITIES:

To perform this job successfully, the person in this position must be able to perform each Essential Job Function. The requirements listed below are representative of the knowledge, skills, and abilities necessary to meet the minimum qualifications for this position.

Required

- High School diploma, GED, or equivalent.
- Strong administrative skills, with knowledge of modern office and clerical practices and procedures, and skills in the operation of a personal computer, including word processing and permitting software, calculator, ruler, copier, fax machine, and telephone.
- Ability to keep sensitive information confidential
- Ability to plan and execute diverse tasks at the same time without supervision.
- Ability to effectively communicate both orally and in writing.
- Documentation to fulfill the requirements of the Immigration and Nationality Act is mandatory within 3 days of employment.

Preferred

- Bachelor's degree in business, public administration, or other related discipline.
- Three (3) years of office management experience.

Special Considerations:

The incumbent will be joining an organization with fewer than 20 full-time positions. As a small and nimble organization, the City of Edgewood needs to hire and retain individuals interested in working with a small team. A hiring objective for this position is to find an employee that will be competently qualified and interested in the work diversity offered by a full-service municipal corporation operating with a limited budget and staffing.

PHYSICAL DEMANDS AND WORKING CONDITIONS:

The physical demands described herein are representative of those that must be met by an employee to successfully perform the essential job functions. The work environment characteristics described herein are representative of those an employee may encounter while performing the essential functions of this position. Work is performed in both field and office settings. This position requires ability to transport oneself to a variety of locations, primarily in and around Pierce County.

While performing the duties of this job, the employee is required to stand, walk, use hands and fingers, handle, feel or operate objects, tools, or controls, and reach with hands and arms. Hand-eye coordination is necessary to operate

computers and various pieces of office and field equipment. The employee is occasionally required to sit, climb stairs or ladders, or balance and walk on scaffolding; stoop, kneel, crouch or crawl; talk and hear. The employee may occasionally be required to lift or move up to 50 pounds with or without a reasonable accommodation. Specific vision abilities required by this job include close vision, distance vision, peripheral vision, and the ability to adjust focus.

Duties are performed both indoors and outdoors under a variety of weather and environmental conditions, including wind, mud, rain, and snow. Duties are usually performed alone, but are also performed as part of a work team. Attendance at some night meetings may be required. The work environment is fast-paced and moderate to very noisy.

ACKNOWLEDGEMENTS:

The statements contained herein reflect general details as necessary to describe the principal functions of this job, the level of knowledge and skill typically required, and the scope of responsibility, but should not be considered an all-inclusive listing of work requirements. Individuals may perform other duties as assigned including work in other functional areas to cover absences or relief, to equalize peak work periods or otherwise to balance the workload.

EQUAL OPPORTUNITY EMPLOYER - AMERICANS WITH DISABILITIES ACT

The City of Edgewood is an Equal Opportunity Employer. Women and minorities are encouraged to apply. Requirements outlined in this job description may be subject to modification to reasonably accommodate individuals with disabilities who are otherwise qualified for employment in this position. However, some requirements may exclude individuals who pose a direct threat or significant risk to the health and safety of themselves or other employees. This job description does not constitute an employment agreement between the Employer and Employee and is subject to change as the needs of the Employer and requirements of the job change.

This position description does not constitute a contract for employment. It is subject to change by the City as the needs of the City and requirements change.

The City of Edgewood is a Drug Free workplace and an Equal Opportunity Employer.

If you meet the minimum qualifications and are interested in applying for this position, please send a cover letter, resume, and signed EOCC statement to:

**City of Edgewood
Human Resources
2224 104th Ave E
Edgewood, WA 98372-1513**

Submittals may also be e-mailed to humanresources@cityofedgewood.org.

Incomplete submittals will be disqualified. Only those applicants selected to move forward in the process may be contacted. Submittals will be retained in accordance with Records Retention practices. If you have questions regarding the application process, please contact human resources at 253-952-3299 or via e-mail at humanresources@cityofedgewood.org.



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SUBJECT: Comprehensive Surface Water Management Plan Update Remaining Schedule and Status	Agenda Item #:	2E	
	For Agenda of:	August 7, 2018	
	Prepared by:	Jeremy Metzler	
ATTACHMENTS (list): ☒ Final Draft SWMP ☒ Utility Rate Study – Comparison of Rate Scenarios			
Approval of Materials:			
Mayor, Daryl Eidinger	☐	Expenditure Required:	N/A
Asst. City Administrator, Dave Gray	☐	Amount Budgeted:	N/A
City Attorney, Carol Morris	☐	Appropriation Required:	N/A
City Clerk, Rachel Pitzel	☐	Timeline: Public Hearing – August 28, 2018 Ord. Adoption – Sept. 11, 2018	
Community Development Director, Darren Groth	☐		
Public Works, Jeremy Metzler	☒		
Fiscal Note/Consideration: The Surface Water Management Plan (SWMP) Update is fully paid for with Surface Water Utility Funds. The Capital Improvement Plan and rate analysis components of this update will recommend revisions to the City's Surface Water Rates, and there will be opportunities for public input and discussion before any such revisions are made.			
SUMMARY STATEMENT: As discussed at prior Study Sessions, we have reviewed Herrera's draft of the comprehensive SWMP update with Mt. View – Edgewood Water Company, the public, and the Planning Commission, soliciting discussion, comment and direction. Based on redlines and revisions, Herrera has prepared the attached final draft. Also included herewith is the analysis from FCS Group for future Surface Water Rates. As presented to Council at the May 1, 2018 Study Session by FCS Group, existing Surface Water Rates barely cover ongoing operations and maintenance costs and do not adequately fund proposed capital improvements. The information attached herewith considers three funding scenarios: • Projects identified in the SWMP as Critical Only • Critical Projects and the proposed Infiltration Pilot Project (pending feasibility assessment results) • All projects identified in the SWMP Updating the SWMP plan and Surface Water Rate Ordinance is necessary to ensure a viable utility over the long-term, which manages both ongoing maintenance and capital improvement needs.			
COUNCIL COMMITTEE REVIEW AND RECOMMENDATION: N/A			
RECOMMENDED ACTION: Discuss and provide feedback on the Surface Water Management Plan and Surface Water Rate scenarios as presented, prior to publication and public hearing consideration.			
ALTERNATIVES TO RECOMMENDED ACTION: 1) Forward to Study Session for further review			

COMPREHENSIVE SURFACE WATER MANAGEMENT PLAN – CITY OF EDGEWOOD



**Prepared for
City of Edgewood
Public Works Department**

**Prepared by
Herrera Environmental Consultants, Inc.**



Note:

Some pages in this document have been purposely skipped or blank pages inserted so that this document will copy correctly when duplexed.

COMPREHENSIVE SURFACE WATER MANAGEMENT PLAN – CITY OF EDGEWOOD

**Prepared for
City of Edgewood**



**Public Works Department
2224 104th Avenue East
Edgewood, Washington 98372**

**Prepared by
Herrera Environmental Consultants, Inc.
1220 Fourth Avenue Northeast
Olympia, Washington 98506
Telephone: 360-292-1221**

**FINAL
July 31, 2018**

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Appendix B	Characteristics of Edgewood's Closed Depression Basins or Potholes
Appendix C	Project Summary Sheets (for projects scheduled for implementation under this plan)
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ACKNOWLEDGEMENTS

This Comprehensive Surface Water Management Plan was produced through the combined efforts, ideas, and cooperation of the following Edgewood City staff, appointed and elected officials, and consultants.

City of Edgewood

Daryl Eiding	Mayor
Dave Gray	Assistant City Administrator
Jeremy Metzler, PE	Public Works Director
Darren Groth	Community Development Director
Mark Creley	City Council
Luke Meyers	City Council
Tyron Christopherson	City Council
Rosanne Tomin	City Council
Stephanie (Shook) Hunter	City Council
John C. West	City Council
Nate Lowry	City Council

Consultants

Herrera Environmental Consultants, Inc.

Joy Michaud	Project Manager/Plan Development
Matt Fontaine	CIP Development and Prioritization
Meghan Mullen	Engineering and Plan Support
Brian Busiek	CIP Design Review
Jennifer Schmidt	Geographic Information Systems Lead
Rebecca Dugopolski	Data Gaps and Needs Assessment Analyst

FCS Group

John Ghuilarducci	Financial Analysis Project Manager
Tage Aker	Financial Analysis Support
Mathew Hobson	Financial Analysis Support

Associated Earth Sciences, Incorporated

Curtis Koger	Hydrogeologist
--------------	----------------

1. INTRODUCTION

Historically, stormwater management referred to management of underground pipes and conveyance networks to enhance draining and reduce flooding. However, urban development over the past century has adversely affected both the volume of runoff generated and the quality of that stormwater runoff. The increased volume of runoff generated can impact erosion, flooding, and stream flows, as well as reduce groundwater recharge. The increased delivery of pollutants can impact stream and groundwater quality and therefore the health of aquatic life and the condition of our drinking water. As a consequence, stormwater management at a city level has become more complex and includes many components, from maintaining the infrastructure of pipes, catch basins, and treatment devices, to programs to educate residents and businesses about reducing pollutants, to creating ways to reduce the volume of stormwater generated and the amount of pollutants it carries.

The National Pollutant Discharge Elimination System (NPDES) is the program that addresses impacts from discharge of pollutants from sources such as stormwater. In Washington State the NPDES program is administered by the State Department of Ecology (Ecology) through authorization from the United States Environmental Protection Agency (EPA). The City of Edgewood's (City) stormwater program is regulated via Ecology's Phase II Western Washington Municipal Stormwater Permit (the Permit). The Permit includes extensive requirements related to stormwater program management, system design requirements, operations and maintenance, and more. In addition to the Permit, the City has obligations associated with the Puyallup River Total Maximum Daily Load (the TMDL) that relate to the management of stormwater.

Effective stormwater management can control runoff to create a developed landscape that behaves more like pre-development conditions by retaining runoff and by providing stormwater treatment. This Comprehensive Surface Water Management Plan (CSWMP) lays out a stormwater management program that reflects the unique features of Edgewood's environment, meets the needs of current and anticipated regulatory requirements (primarily requirements of the NPDES program), and identifies Capital Improvement Program (CIP) projects that address existing problems. It also outlines the staffing, equipment and financial resources needed for the City to fully implement the plan.



Public involvement.

1.1. PURPOSE OF THIS PLAN

The purpose of this plan is to guide the City's stormwater management program in a manner that protects public and private infrastructure; provides protection for natural resources; is consistent with applicable local, state, and federal regulations; and establishes an equitable stormwater utility rate that reflects these needs. The plan:

- Establishes goals for stormwater management in the city (Section 1)
- Provides background information on the area and stormwater system (Section 2)
- Describes stormwater and surface water problems the City is experiencing and potential solutions (Section 3)
- Describes the different components of the stormwater management program and recommendations for improvement (Section 4)
- Provides a plan for implementation that identifies resource needs and focuses on efficient use of limited resources (Section 5)
- Provides a financial analysis to support the highest priority needs (Section 6)

The information provided in the different sections of this report is supported by a number of appendices:

- Appendix A provides detail on the City's existing stormwater program and provides detailed recommendations for improvement.
- Appendix B summarizes size and flooding characteristics of Edgewood's potholes.
- Appendices C and D contain project summary sheets and cost estimates for each of the CIP projects identified during this planning effort.
- Appendix D contains the subbasin inventory for the City, essentially a compilation of the GIS data derived for each of the subbasins.

1.2. REGULATORY DRIVERS

Due to the critical importance of stormwater and its relationship to the protection of natural resources there are many regulatory drivers, the following describes those that are most relevant to the development of this CSWMP:

- The primary regulatory driver for Edgewood's stormwater program is, and will continue to be, the Permit. The Permit is driven by the federal Clean Water Act. It has extensive requirements related to stormwater program management, system design requirements,

operations and maintenance, and more. Section 4 of this CSWMP details the specific Permit requirements and their impact on the City's CSWMP. (The existing Permit became effective in August 2013 and covers the years from 2013 -2019. This comprehensive plan will also be in effect for the as yet to be approved 2019 Permit. Preliminary draft language that has been released for the 2019–2023 NPDES Phase II Permit (Ecology 2017). The draft includes significant changes in terms of requirements related to watershed planning, characterization of outfalls, and expansion of source control programs.

- State surface water and groundwater quality standards require the City to manage discharges from stormwater systems in a manner that supports achieving these standards.
- There is a Total Maximum Daily Load (TMDL) for the Puyallup watershed which includes Jovita Creek; a stream for which a small part flows through Edgewood. In addition to participating in the TMDL Implementation group, the TMDL requires that Edgewood implement Illicit Discharge Detection Elimination (IDDE) activities in the Jovita Creek basin.
- The federal Endangered Species Act (ESA) protects listed species and prohibits activities that might result in a loss or "take" of a listed species. This includes activities related to the City's stormwater program.
- The Washington State Growth Management Act (GMA) requires the City to inventory and protect environmentally critical areas (such as steep slopes, wetlands, and streams) (Chapter 36.70A of the Revised Code of Washington). The GMA also requires the City to develop comprehensive plans to ensure environmentally responsible and economically sustainable development, including planning for stormwater-related capital facilities. The state regulation addressing Underground Injection Control (UIC) wells defines how wells will be assessed and constructed and requires extra protection for those determined to be a high threat to groundwater. Many stormwater facilities are defined as wells if they infiltrate directly to the ground.
- Several sections of the Edgewood Municipal Code (EMC) govern aspects of stormwater management for new development and redevelopment project sites.

1.3. GOALS AND POLICIES

The following goals and policies from the City's Comprehensive Plan are relevant to this CSWMP and the operations of the stormwater utility.

- Goal NA.II. Protect and enhance water quality.
- Goal NA.V. Minimize risks to people, property, and the environment posed by geological and flood hazard areas.

- Goal U.I. Ensure the location and design of utility facilities meets the community's needs.
- Goal U.II. Support the provision of quality utility services that are reliable, efficient, and financially and environmentally sustainable.
 - o Policy U.II.c. Support timely expansion, maintenance, and replacement of utility facilities.
 - o Policy U.II.d. Encourage the use of new technologies that will enhance the quality of utility services, and that are financially feasible and consistent with community needs.
 - o Policy U.II.e. Support improvements in utility services that support local businesses and economic development.
 - o Policy U.II.f. Encourage public education that reduces demand for utility services.
- Goal U.III. Work with regional partners to address regional utility issues.
- Goal CF.II. Provide adequate capital facilities that address past deficiencies, meet the needs of growth, and enhance the quality of life through acceptable level of service.
- Goal CF.III. Ensure that planned capital facilities are financially feasible.
- Goal CF.IV. Design and locate capital facilities with features and characteristics that support the environment, energy efficiency, aesthetics, technological innovation, cost-effectiveness, and sustainability.
- Goal CF.V. Maintain capital facilities so that they are reliable, functional, safe, sanitary, clean, attractive, and financially sustainable.
- Goal LU.III. Promote development that respects and preserves the natural environment.
 - o Policy LU.III.f. Protect the quality and quantity of water resources.
- Goal PR.V. Protect and manage natural areas for the enjoyment of current and future generations.

The following additional goals have been developed to guide the City's CSWMP. They support actions that will reduce flooding impacts, ensure stormwater is managed efficiently, and protect water resources:

- Implement, improve, and refine (adaptively manage) a surface water management program that protects the natural environment, reflects current regulations, is fiscally responsible, and that meets sustainability goals of the City.

- Build, maintain and repair the City's stormwater infrastructure in a cost-effective manner that supports attainment of the flow, water quality and financial goals of this surface water management plan.
- Ensure the regulations, policies, and guidance documents that provide the framework for the City's stormwater program (the stormwater manual, stormwater comprehensive plan, and City municipal code) are regularly updated.
- Operate the stormwater management program within the constraints of the stormwater utility budget and through active collaboration with other programs, agencies, and through leverage of other funding mechanisms.
- Comply with all applicable requirements from federal, state, and local governments related to water resource protection.
- Protect surface waters from the impacts of increased pollutant loads, flooding and erosion through fully supporting requirements of the adopted stormwater manual and by encouraging practices that reduce use of pesticides, fertilizers, and other contaminants and education to support proper disposal of wastes.
- Protect groundwater resources and supplies by regulating land use activities, requiring a higher level of stormwater treatment within wellhead protection areas, encouraging practices that promote responsible infiltration, preserve native soils and vegetation, and by encouraging use of low-impact vegetation.
- Guide regional development of the stormwater management and resource protection framework through participation in local and regional management and planning groups.
- Encourage engagement of the public in stormwater management through providing education, opportunities for involvement and stewardship, and soliciting public input to the stormwater management program.
- Focus on public education and training as first steps in addressing stormwater concerns and enforcement as needed.
- Prioritize the most beneficial and cost-effective projects and programs to ensure that available resources are used efficiently.
- Implement an equitable and logical stormwater utility rate structure.

1.4. PLAN DEVELOPMENT

The first step in development of this plan was to review the previous Surface Water Management Plans. Generally, earlier plans identified a similar series of problems including; erosion in streams, local conveyance flooding issues, steep slopes, and flooding of closed depression basins (potholes). During this initial data and document review stage, GIS and other pertinent data was acquired and reviewed in preparation for the project kickoff workshop.

City staff from multiple departments and key members of the consultant team attended a plan development workshop. The purpose of the workshop was to gather information on general background conditions in the city, the existing stormwater system, recent and planned stormwater facilities; and to discuss how the City is addressing meeting different components of the Permit. In addition, the team developed a list of problems and needs. In preparation for the workshop a detailed questionnaire about the City's stormwater program was distributed to participants to help gather staff input and perspectives on a consistent set of questions. The findings from the questionnaire were used to facilitate the workshop.

Following the workshop, progress toward development of this plan occurred on five fronts

- Background characterization data was obtained and summarized to form the framework for the CSWMP.
- An evaluation of data gaps and needs related to complying with the Permit was carried out, including a summary of staffing, equipment, and budget needs to support the program.
- CIP's were identified and prioritized through discussions with the City and conceptual designs were prepared.
- A more detailed study (feasibility assessment) was developed for potentially discharging treated stormwater to the ground and a grant application was prepared to support the effort.
- A financial analysis of the stormwater utility was completed to evaluate implementation of plan recommendations.

Information from these different efforts was then used to develop this CSWMP and to lay out a plan for its implementation.

2. STUDY AREA CHARACTERISTICS

Edgewood is located in Pierce County and is bordered by the cities of Puyallup, Sumner, Pacific, Fife, and Milton, and by areas of unincorporated King and Pierce Counties. The city encompasses approximately 8.5 square miles (5,540 acres). Most (80 percent) of the city is situated on the top of a steep sided plateau called the North Hill Plateau, while the remainder lies in the Puyallup River valley. The 2010 Census estimate of the city's population was 9,387. Edgewood's estimated population in 2015 was 10,734, representing a 9 percent growth over the six-year period (US Census Bureau 2016).

2.1. DRAINAGE BASIN CHARACTERISTICS

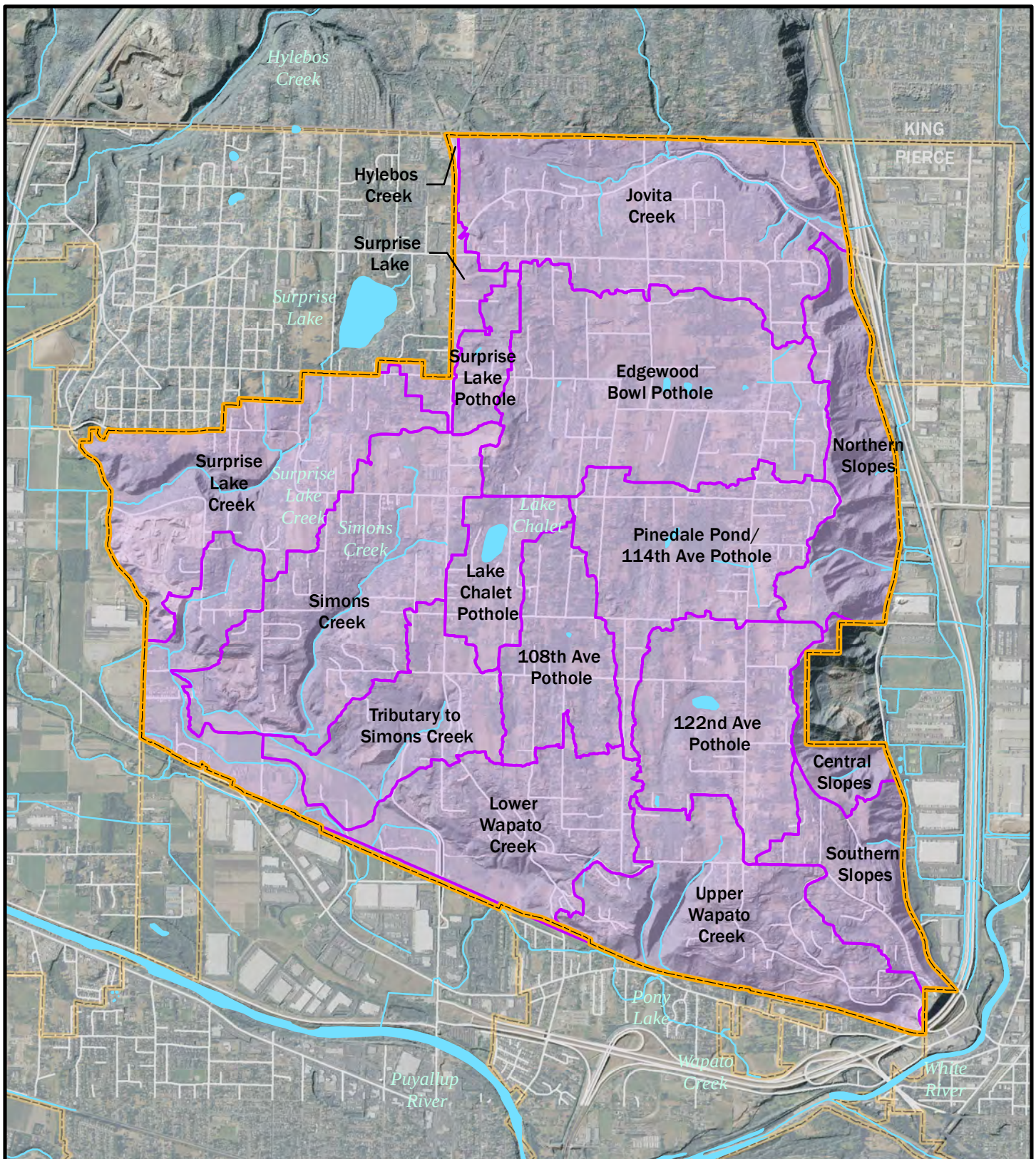
In the previous surface water management plan (Kato & Warren 1997), the city was divided into 14 subbasins delineated to the extent known by their hydrologic boundaries. Those subbasins have been revised slightly and re-sorted into 18 drainage subbasins using more recent Lidar mapping (Table 2-1 and Figure 2-1). These 18 subbasins have been divided into seven groups that reflect the either the main perennial stream basin that they are affiliated with or their similar geographic features.

Most of the project area is characterized as a plateau ranging from 300 to 500 feet in elevation with steep slopes to the west, south, and east above flat river valley floodplains around 40 to 70 feet in elevation. As described in the sections below, many of the subbasins convey water from the plateau through steep ravines to the valley bottom, which results in erosion and sedimentation concerns. Another feature of the city is that much of the plateau area is characterized by several closed depressions, known locally as potholes, which collect water during the wet season, frequently resulting in flooded roads, property, and houses during wet winters.

Table 2-1. Drainage Basin Size and Impervious Surface Characteristics.			
Basin Group/ Subbasins	Area Within the City (acres)	Impervious Surface	
		(acres)	(percent)
White River Basin			
North Slopes	274.3	23.1	8%
Central Slopes	75.2	3.7	5%
Southern Slopes	194.0	62.1	32%
Jovita Creek Basin			
Jovita Creek	622.4	121.1	19%
Puyallup River Basin			
Upper Wapato Creek	444.6	82.7	19%
Wapato Creek Basin			
Lower Wapato Creek	576.6	133.0	23%
Simons Creek Basin			
Simons Creek	529.2	130.5	25%
Tributary to Simons Creek	261.3	39.1	15%
Hylebos Creek Basin			
Surprise Lake Creek	474.7	86.3	18%
Surprise Lake	62.3	22.7	36%
Hylebos Creek	4.7	2.9	62%
Pothole Basins			
Edgewood Bowl Pothole	656.0	136.0	21%
Lake Chalet Pothole	136.0	36.5	27%
Pinedale Pond/114th Avenue Pothole	384.3	83.5	22%
108th Ave Pothole	225.9	49.2	22%
122nd Ave Pothole	347.7	60.5	17%
Surprise Lake Pothole	73.8	17.8	24%
Total	5,343.0	1,090.6	20%

White River Basin

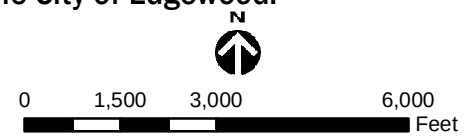
The White River basin includes three subbasins: the North, Central, and Southern Slopes, which drain from the eastern edge of the city. They are similar in size and geography. Each subbasin consists of three distinct topographical areas: a small portion of the upland plateau, the steep slopes, and the flat lowland plain. Surface flow from these subbasins is carried to the White River via culverts, overland flow, and roadside ditches. The steeply sloped areas are mostly undeveloped and covered by second- or third-growth trees and brush. The flatter areas on the plateau are more developed, but this area comprises only a small portion of the basin. The steep, sandy side slopes have formed deep ravines. As would be expected due to the steep slopes, erosion and sedimentation are problematic and may increase as development within the basin increases.



Legend

- Edgewood City limits
- County boundary
- City limits
- Subbasin
- Waterbody
- Road

Figure 2-1.
Subbasin Boundaries
in the City of Edgewood.



Source: Herrera

Jovita Creek Basin

Jovita Creek basin is located in the northeast section of the city. It is one of the largest basins within the city; however, most of the contributing area lies outside of the city. Similar to other basins in Edgewood, a portion of the basin in the uplands (elevation above 300 feet) and a narrow, steep stream corridor leading to the valley floor (elevation around 70 feet).

The drainage basin for Jovita Creek is approximately 2.9 square miles; the majority of which extends north of Edgewood into unincorporated King County, approximately one third of the drainage basin (0.9 square miles) lies within the city. There are two main tributaries to Jovita Creek. The southern tributary is located north of Edgewood, east of Meridian Avenue and flows from a large wetland complex. The other tributary encompasses a much larger drainage area including Spider Lake, Fivemile Lake, and Trout Lake. Trout Lake in King County is an important source of base flow to the stream.

Except for the commercial area along Meridian Avenue East and Eighth Street East and the agricultural area on the valley floor, only few small subdivisions have been developed within the subbasin and within city limits. The large portion of the subbasin within unincorporated King County and the city of Pacific is more heavily developed. Thus, upstream watershed use that is outside of the City's purview is a driving factor in the condition of this subbasin.

Within the city, the main stem of Jovita Creek flows in a steep-sided canyon. At the mouth of the canyon, the stream flows adjacent to Jovita Creek Boulevard before its confluence with the Milwaukee Ditch (Soatan Creek), which flows southerly to the White River. The adjacent hill slopes in the canyon are subject to frequent slides caused by runoff from the plateau above, tree falls, unstable slopes, and high flows in the creek. Jovita Boulevard East has been washed out on several occasions due to flooding and sediment discharge from Jovita Creek.

Puyallup River Basin

The Puyallup River basin is the discharge point for the Upper Wapato Creek subbasin. A portion of this subbasin is located on the plateau. There is a very steep section with multiple steep ravines draining from the plateau toward the Pony Lake area, but the topography toward the east (in the southeastern corner of the city) is more moderately sloped as it moves from the plateau to the valley floor.

Wapato Creek Basin

The Wapato Creek basin within the city of Edgewood includes only the Lower Wapato Creek subbasin because the stormwater conveyance system has directed subbasins that might naturally have been directed toward Wapato Creek to the Puyallup. This subbasin conveys runoff from the south central area of the city to Wapato Creek. Similar to the other subbasins in Edgewood, the Lower Wapato Creek subbasin includes an upland region located on the plateau area that is connected to the valley by steep slopes. The sloped area remains undeveloped and

covered by second- or third-growth trees and brush. The most development in the basin occurs downstream in the flat valley. Erosion and sedimentation are concerns as the water is conveyed through the deep ravines on the steep slopes and this may increase as development within the plateau area of the basin increases.

Simons Creek Basin

Simons Creek basin includes two subbasins: Simons Creek, and Tributaries to Simons Creek. These two subbasins are located entirely within city limits in the southwest area of the city. Like much of Edgewood, most of the contributing area to these subbasins is situated on the plateau with a narrow, steep stream corridor leading to the valley floor. The most significant drainage feature in these subbasins is Simons Creek. The residential and commercial areas along Meridian Avenue comprise most of the impervious area in the basin.

Hylebos Creek Basin

The Hylebos Creek basin includes the Surprise Lake Creek, Surprise Lake, and Hylebos Creek subbasins. These subbasins are located in the northwest corner of the city. Surprise Lake subbasin is upstream of Surprise Lake and Surprise Lake Creek is downstream of the lake, all of it flows to Hylebos Creek. Surprise Lake itself (and much of the Surprise Lake subbasin) is located outside of the city of Edgewood in the city of Milton, along with most of the Hylebos Creek basin. The Surprise Lake and Surprise Lake Creek subbasins convey water from a fairly large drainage area on the upland plateau and then through the narrow, steep corridor of Surprise Lake Creek. Except for the commercial area along Meridian Avenue East, most of the subbasin areas within Edgewood are lightly developed compared to Milton, which includes some multi-family developments; this is especially true for the area surrounding Surprise Lake. As a result, roads and commercial developments comprise a high percentage of the man-made impervious area in the basin.

Pothole Basins

Unlike the other basins in the city, the following six pothole basins are located entirely on the plateau area and are entirely within the city limits: Edgewood Bowl Pothole, Lake Chalet Pothole, Pinedale Pond/114th Avenue Pothole, 108th Avenue Pothole, 122nd Avenue Pothole, and Surprise Lake Pothole basins. These are closed-depression basins; there are no natural flow paths that connect these subbasins with nearby stream systems. These basins contain undulating hills on the plateau and wetlands or other surface water features within the potholes themselves. Development density in the pothole basins is primarily low, with some more heavily developed areas within the Lake Chalet and Surprise Lake Potholes. The majority of impervious surface in the pothole subbasins comes from roads and single-family homes. Flooding in these subbasins already occurs with regular frequency. There is significant potential for future development throughout these basins, which is expected to result in more frequent and extensive flooding in the future.

2.2. GEOLOGY AND SOILS

The majority of the city of Edgewood is located on the upland called the North Hill plateau. This plateau is overlain with till that was formed as the glacier advanced during the Vashon glaciation 15,000 to 13,500 years ago. As the glacier retreated, water from the melting ice deposited over the till thick layers of sand and gravel called outwash. The outwash was left in irregular heaps and was pitted with hollows that became today's "potholes" (Kato & Warren 1997). Therefore, the upland area consists of Vashon till, which is dense, non-stratified silty sand to sandy silt with slow permeability in unweathered zones, and Vashon recessional outwash deposits, which includes well-sorted, stratified, unconsolidated coarse-grained sediment with rapid permeability. The steep valley walls bordering the plateau contain exposed outcrops deposited before the Vashon glaciation. These deposits include the Stuck drift, the Puyallup formation, and the Salmon Springs drift.

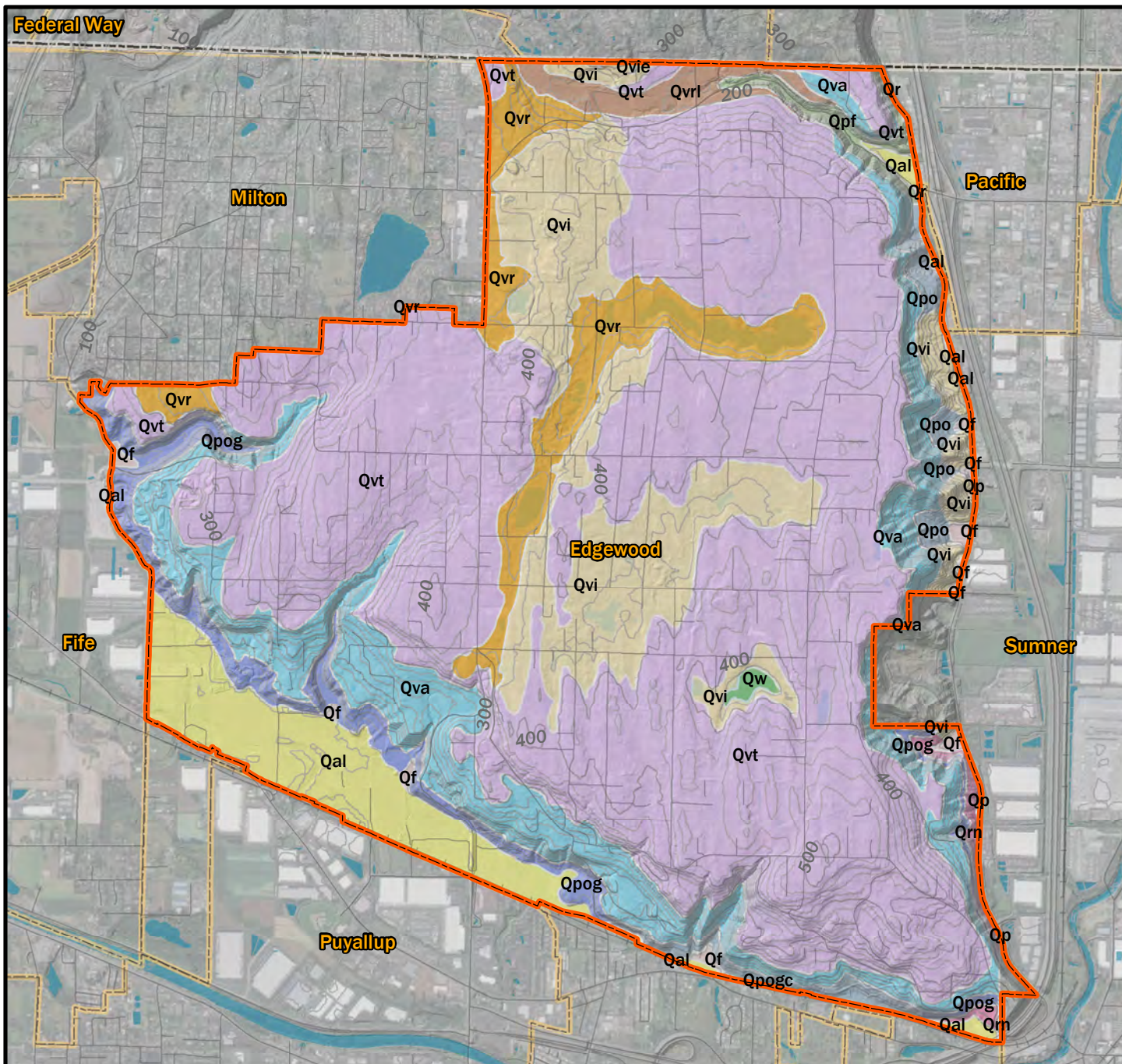
Soils are often categorized by hydrologic soil group (HSG) according to their ability to infiltrate water. Based on HSG classification most of the city would have soils amenable to infiltration. However, in the case of Edgewood and many other areas in the Puget Sound basin, it is the underlying geology not the soils that drive infiltration capacity. In much of the city there is a dense till layer that sits approximately 2 to 4 feet below the ground surface (Figure 2-2). This layer prevents water from seeping deeper into the ground. In fact, when surface soils are disturbed even this narrow soil layer can be lost or compromised leading to increased runoff and an increased potential for flooding.

2.3. LAND USE AND ZONING

Land use is linked with the percentage of impervious surface that, in combination with soil drainage properties, determines the amount of stormwater runoff generated by a parcel. Land use also impacts the type and concentration of pollutants that might be expected to accumulate on the land surface. Existing land use has not been mapped for the City, but in the case of Edgewood, existing zoning (as of 2015) is a fair surrogate measure. The City's zoning mapping was condensed into 12 generalized categories. Table 2-2 describes generalized development and typical runoff characteristics associated with each land use/zoning category, and Table 2-3 and Figure 2-3 show the distribution of zoning categories by drainage basin. In the future it can be expected that impervious surface will increase significantly as the population expands and the city densifies. Another important change will likely be growth in the number and type of businesses that occupy commercial/industrial zones.

Overall, land use (as defined by zoning) within the city is currently largely residential, with over 75 percent of the city zoned as low and moderate single family residential development. The following are some general land use patterns:

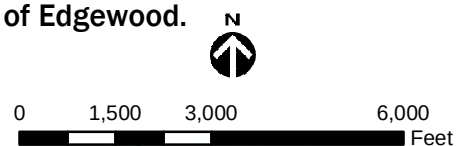
- Residential land use is by far the dominant land use type.
- Meridian Avenue East includes the highest density developments with town center, commercial, and mixed use residential land uses.
- The flatter areas in the White River and Puyallup River valleys contain pockets of industrial, commercial, and mixed use residential land uses on the outer edges of the city.
- The coverage of impervious surface in Edgewood is closely related to land use. In general, the areas with the most impervious surface tend to coincide with the higher density residential and commercial areas such as Meridian Avenue East (Jovita Creek, Surprise Lake Creek, Surprise Lake, and Surprise Lake Pothole basins) and the White River Valley (North Slopes Subbasin) (Table 2-3).



Legend

	Edgewood city limits		Qf - Fan deposit		Qpogc - Pre-Olympia glacial deposit-coarse grained
	City limits		Qvr - Vashon recessional outwash deposit		Qr - Reversely magnetized deposit
	County boundary		Qvrl - Vashon recessional lacustrine deposit		Qrn - Reversely magnetized deposit non-glacial
	Waterbody		Qvi - Vashon ice-contact deposit		
	Road		Qvie - Vashon eskers		
	Contour (20 ft)		Qvt - Vashon glacial till		
	Contour (100 ft)		Qva - Vashon advance outwash		
GeoLabel			Qpf - Pre-Fraser deposit		
	Qw - Wetland deposit		Qpo - Pre-Olympia deposit		
	Qp - Peat		Qpog - Pre-Olympia glacial deposit		
	Qal - Alluvium				

Figure 2-2.
Geologic Units as Mapped for the
City of Edgewood.

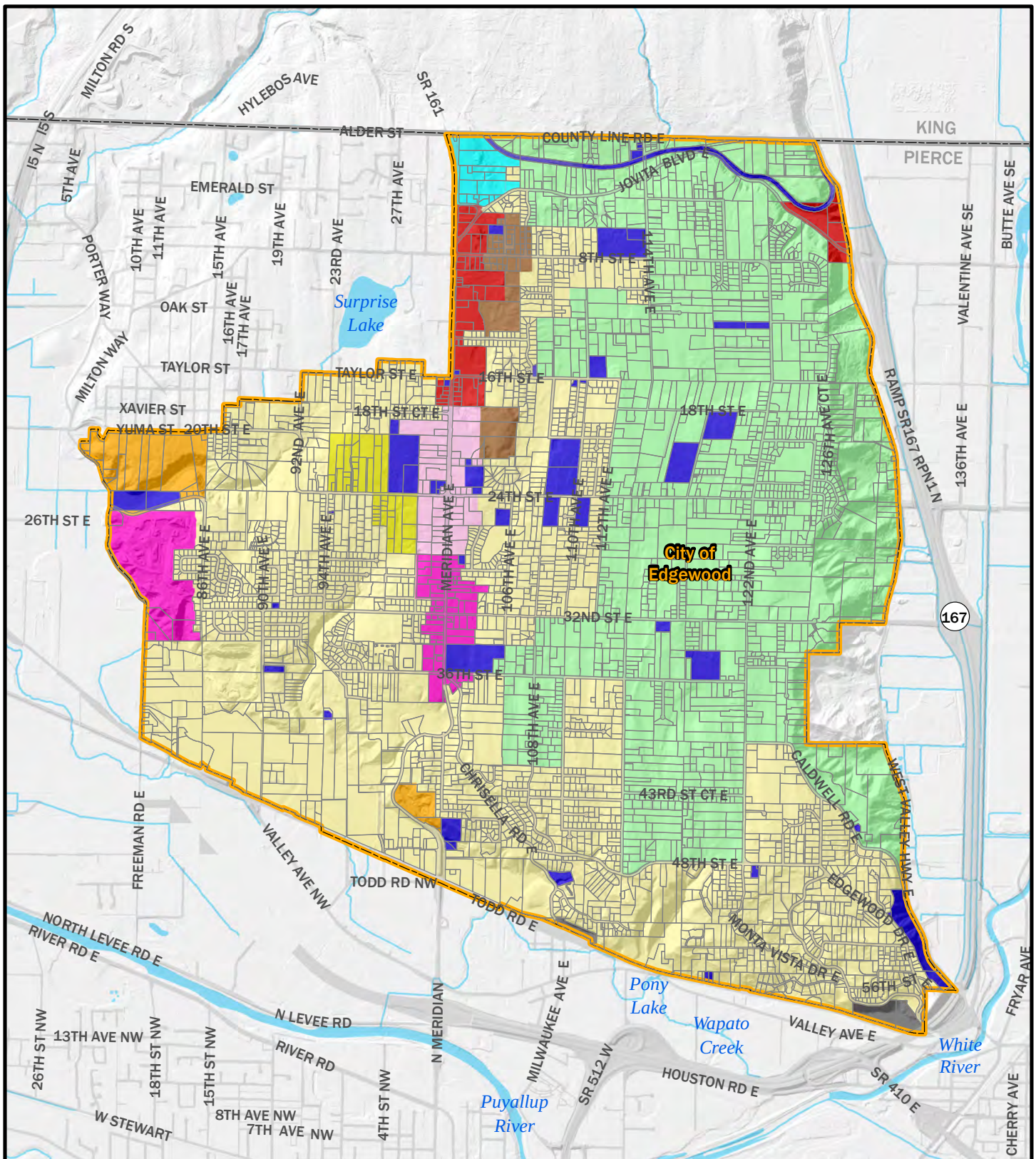


ESRI, Aerial (2015)

Table 2-2. Land Use Characteristics and Percent of Edgewood Zoned for each Category in 2015.		
Land Use Category (zoning equivalent)	Generalized Properties	Zoning Area (percent)
Business Park	This land use accommodates a wide range of employment and commercial uses, including professional office, senior housing and apartments, light industrial and retail uses. Significant landscaping is emphasized in this zone, and impervious surface percentages are moderate.	0.7%
Commercial	Allowable use includes large format retail, auto-oriented uses, and regional scale commercial uses. Light industrial uses are also allowed. This land use provides a transition to the Town Center, and multifamily housing is allowed. Generally high percentage of impervious surface.	1.9%
Industrial	This land use provides for regional research, light manufacturing, warehousing, and other major regional employment uses. Industrial lands are limited to areas where regional transportation access is available. Generally high percentage of impervious surface.	0.3%
Mixed Residential – Low (MR-1)	Low residential density using a variety of urban housing types and designs, including small-lot detached dwellings, duplexes, and townhouses. Impervious surface percentages are low to moderate.	1.7%
Mixed Residential – Medium (MR-2)	Moderate residential density using a variety of urban housing types and designs, including small-lot detached dwellings, duplexes, and townhouses. Generally associated with a moderate percentage of impervious surface	1.2%
Mixed Use Residential	This land use includes a variety of medium density housing types and some commercial and professional office uses. This serves as a transition to areas of more intensive development. Impervious surfaces are moderate to high.	2.9%
Public	This land use provides for moderate-scale and large-scale activities relating to the purpose of state and local governmental entities and semi-public institutions providing necessary public services, including utilities and open spaces. Associated with a fairly high percentage of impervious surface, though parks and open spaces are associated with lower percentages of impervious surface.	3.9%
Public ROW^a	Includes highway ROWs. Generally associated with a high percentage of impervious surface, although planted areas within the ROW may allow for significant infiltration.	0.1%
Single Family – Low (SF-2)	This land use contains large residential lots with extensive tree coverage. The percentage of impervious surface is low.	38.8%
Single Family – Medium (SF-3)	Single family medium and high land use categories are the City's primary residential zones. The percentage of impervious surface is low to moderate.	45.5%
Single Family – High (SF-5)	Single family medium and high land use categories are the City's primary residential zones. The percentage of impervious surface is moderate.	1.2%
Town Center	The Town Center is an integral part of the City's economic development strategy emphasizing a planned mix of pedestrian-oriented commercial, business, and residential development. Impervious surface percentages are high.	1.7%

^a Visual inspection of land use areas with no land use designation indicates that these areas are part of the Public ROW and have been included in this category.

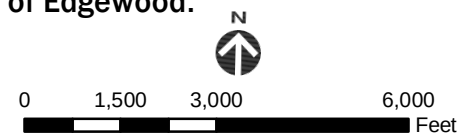
Basin Group/Subbasin	Business Park		Commercial		Industrial		Mixed Residential – Low (MR-1)		Mixed Residential – Moderate (MR-2)		Mixed Use Residential		Public		Public ROW		Single Family – Low (SF-2)		Single Family – Moderate (SF-3)		Single Family – High (SF-5)		Town Center	
	(ac)	(%)	(ac)	(%)	(ac)	(%)	(ac)	(%)	(ac)	(%)	(ac)	(%)	(ac)	(%)	(ac)	(%)	(ac)	(%)	(ac)	(%)	(ac)	(%)	(ac)	(%)
White River Basin																								
North Slopes	0.0	0%	4.2	2%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	270.1	98%	0.0	0%	0.0	0%	0.0	0%
Central Slopes	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	75.2	100%	0.0	0%	0.0	0%	0.0	0%
Southern Slopes	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	18.6	10%	0.0	0%	35.5	18%	139.9	72%	0.0	0%	0.0	0%
Jovita Creek Basin																								
Jovita Creek	34.8	6%	33.6	5%	0.0	0%	0.0	0%	22.1	4%	0.0	0%	42.9	7%	0.0	0%	423.9	68%	65.2	10%	0.0	0%	0.0	0%
Puyallup River Basin																								
Upper Wapato Creek	0.0	0%	0.0	0%	18.3	4%	0.0	0%	0.0	0%	0.0	0%	2.0	0%	1.4	0%	69.5	16%	353.5	80%	0.0	0%	0.0	0%
Wapato Creek Basin																								
Lower Wapato Creek	0.0	0%	0.0	0%	0.1	0%	13.8	2%	0.0	0%	12.7	2%	8.9	2%	1.4	0%	24.6	4%	515.1	89%	0.0	0%	0.0	0%
Simons Creek Basin																								
Simons Creek	0.0	0%	0.0	0%	0.0	0%	0.0	0%	5.4	1%	15.6	3%	29.8	6%	0.0	0%	0.0	0%	366.4	69%	42.8	8%	69.3	13%
Tributary to Simons Creek	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	27.7	11%	9.8	4%	0.0	0%	0.7	0%	223.2	85%	0.0	0%	0.0	0%
Hylebos Creek Basin																								
Surprise Lake Creek	0.0	0%	0.0	0%	0.0	0%	76.8	16%	0.0	0%	76.7	16%	15.0	3%	0.0	0%	0.0	0%	278.2	59%	21.8	5%	6.2	1%
Surprise Lake	0.0	0%	42.9	69%	0.0	0%	0.0	0%	1.1	2%	0.0	0%	0.6	1%	1.0	2%	0.0	0%	15.0	24%	0.0	0%	1.8	3%
Hylebos Creek	4.7	100%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
Pothole Basins																								
Edgewood Bowl Pothole	0.0	0%	0.0	0%	0.0	0%	0.0	0%	13.3	2%	0.0	0%	49.2	8%	0.0	0%	428.3	65%	165.1	25%	0.0	0%	0.1	0%
Lake Chalet Pothole	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	24.5	18%	14.5	11%	0.0	0%	0.6	0%	91.3	67%	0.0	0%	5.2	4%
Pinedale Pond/ 114th Avenue Pothole	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	5.7	1%	0.0	0%	350.4	91%	28.2	7%	0.0	0%	0.0	0%
108th Avenue Pothole	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.8	0%	0.0	0%	114.9	51%	110.2	49%	0.0	0%	0.0	0%
122nd Avenue Pothole	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	10.3	3%	0.0	0%	278.3	80%	59.1	17%	0.0	0%	0.0	0%
Surprise Lake Pothole	0.0	0%	23.0	31%	0.0	0%	0.0	0%	21.0	28%	0.0	0%	0.3	0%	0.0	0%	0.0	0%	21.4	29%	0.0	0%	8.1	11%
Total	39.5	1%	103.6	2%	18.4	0%	90.6	2%	62.8	1%	157.1	3%	208.2	4%	3.8	0%	2,072.0	39%	2,431.8	46%	64.6	1%	90.7	2%



Legend

Tax parcel	Zoning			
Edgewood city limits	SF-2	MR-1	BP	
County boundary	SF-3	MR-2	I	
Waterbody	SF-5	MUR	Public	
	C	TC	Public ROW	

Figure 2-3.
2015 Mapped Zoning Designations in
City of Edgewood.



Source: City of Edgewood

2.4. SURFACE WATER RESOURCES

The key surface water features in Edgewood include four perennial streams and six closed depression basins, referred to as potholes. With the exception of the pothole called Lake Chalet, which retains water year-round, the potholes are a series of open-water wetlands during most of the year but become lake-like during the winter when they are filled by stormwater runoff. These water bodies, shown in Figure 2-4, are all within the Puyallup River Watershed, which is tributary to Commencement Bay in Puget Sound.

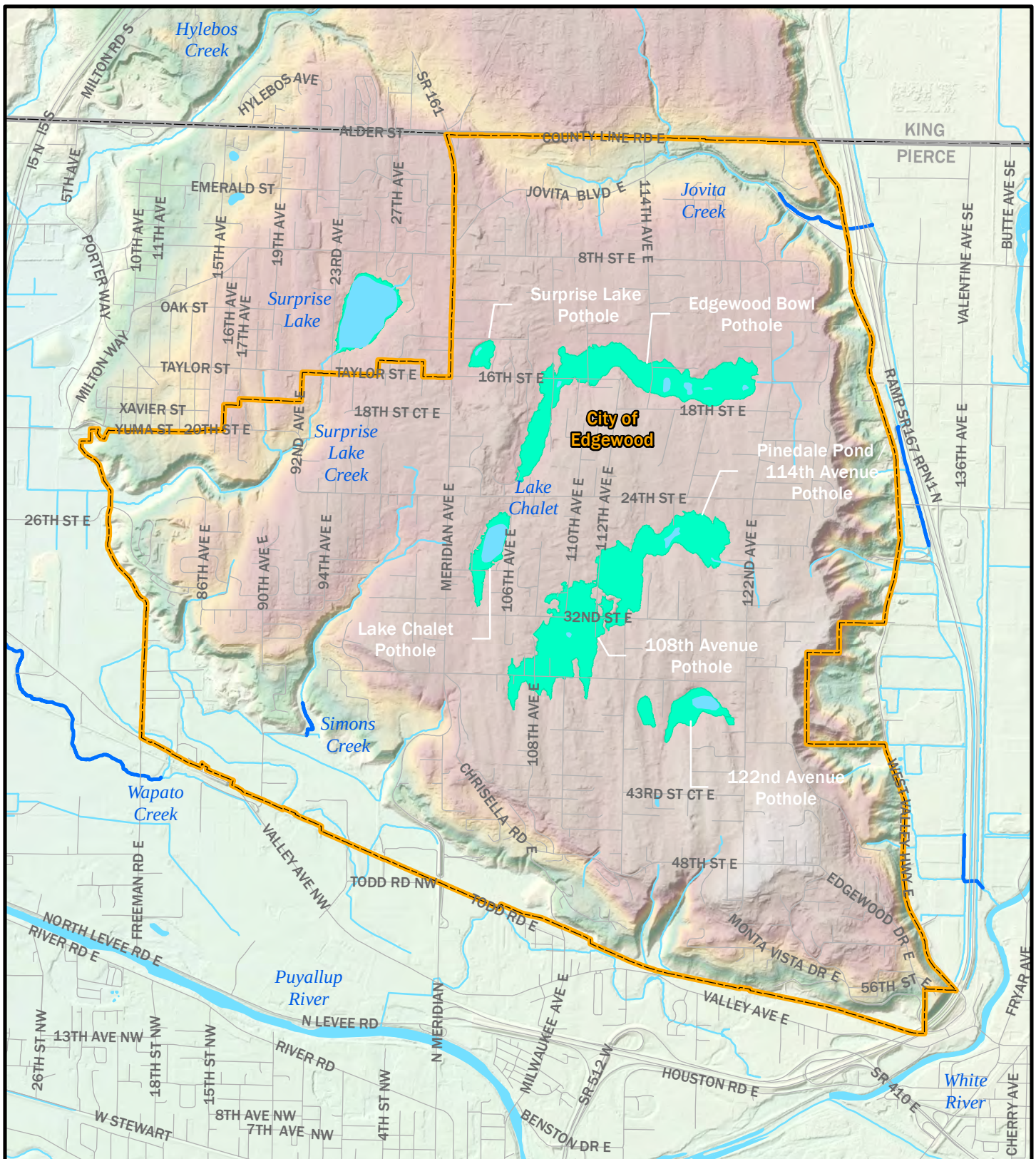
Brief information about each water body is provided below. Water quality is summarized in terms of the water body's inclusion on Washington State's most recent Water Quality Assessment (Ecology 2015). The Water Quality Assessment is a requirement of the Clean Water Act and is regulated by the US Environmental Protection Agency (EPA). Washington State Department of Ecology (Ecology) is responsible for implementing the Clean Water Act at the state level and conducts the biennial water quality assessment. In this assessment water bodies are grouped into five categories:

- Category 1: Meets tested standards for clean waters.
- Category 2: Waters of concern. (There may be some evidence of pollution but not enough to require a TMDL or clean-up plan.)
- Category 3: Insufficient data.
- Category 4: Polluted waters that do not require a clean-up plan. (Typically, this is because a plan is already in place or the impairment is related to flow rather than water quality.)
- Category 5: Polluted waters that require a TMDL, or other clean-up plan. (Traditionally referred to as the "303(d) list," Ecology 2015.)

2.4.1. Streams

Jovita Creek

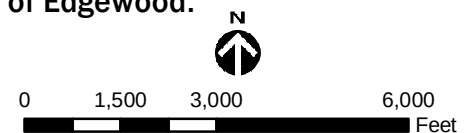
The drainage basin for Jovita Creek is approximately 2.9 square miles, the majority of which extends north of Edgewood into King County; approximately one-third of the drainage basin (0.9 square miles) lies within the city. There are two main tributaries to Jovita Creek. The southern tributary is located north of Edgewood, east of Meridian Avenue. The headwaters area consists of a large emergent wetland (Kato & Warren 1997). The other tributary flows from Trout Lake in King County and is an important source of base flow to the stream. Within the city, the main stem of Jovita Creek flows in a steep-sided canyon. At the mouth of the canyon, the stream flows adjacent to Jovita Creek Boulevard before its confluence with the White River. The adjacent hill slopes in the canyon are subject to frequent slides caused by runoff from the plateau above, tree falls, unstable slopes, and high flows in the creek. Jovita Boulevard East has been washed out on several occasions due to flooding and sediment discharge from Jovita Creek.



Legend

- | | |
|--|---|
|  Edgewood city limits |  Pothole |
|  County boundary |  Road |
|  Untyped Stream/Drainage Course | |
|  Type F Stream (Fish Bearing) | |
|  Waterbody | |

Figure 2-4.
Surface Water Features in the
City of Edgewood.



Source: City of Edgewood

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Due to bacteria exceedances of state water quality standards, Jovita Creek is considered an “impaired water” and is therefore included on the Washington State 303(d) list and was included as part of the Puyallup River bacteria TMDL. Since there is a TMDL in place for the Puyallup it, and Jovita Creek, are listed as Category 4 waters, indicating that there is a pollutant of concern but that a plan is in place to address the issue. The City’s responsibilities under the TMDL are to track construction activities in the Jovita Creek basin and prioritize field screening for illicit discharges in this area.

Simons Creek

Formed in a steep ravine in the southern portion of Edgewood, Simons Creek is fed by stormwater runoff. Although the headwaters are near Lake Chalet, there is currently no direct hydrologic connection between the stream and the Lake Chalet pothole. No homes or roads on the plateau are threatened by the stream, but residents on the valley floor experience frequent high sediment flows out of the ravine. After leaving the ravine, Simons Creek flattens out and flows approximately a mile before entering Wapato Creek.

Due to bacteria exceedances of state water quality standards, Simons Creek is considered an “impaired water” and is therefore included on the Washington State 303(d) list. Simon’s Creek is listed as Category 5 because there is no clean-up plan or TMDL in place to address this issue. There is also a Category 2 listing due to potential for benzene pollution, and it is listed as Category 4 due to low instream flow.

Surprise Lake Creek

Surprise Lake Creek is the outflow from Surprise Lake near the western boundary of the city. Most of the lower portion of this stream flows through a steep ravine; the slope decreases just east of Freeman Road. Then the stream is culverted across private property and enters a culvert under Freeman Road before joining Hylebos Creek (Kato & Warren 1997). The steep ravine through which the stream travels is subject to frequent slides and erosion. Surprise Lake Creek is listed as Category 5 for mercury and as Category 2 for potential pH impairment.

Wapato Creek

Although a significant portion of the city conveys water toward Wapato Creek, only a small portion of the stream lies in the southwest corner of the city. The stream is located in the flat river valley bottom flowing somewhat parallel to the Puyallup River. Several drainages convey runoff west from the southern slopes of the city into the Blair Waterway and then into Commencement Bay in Puget Sound. Wapato Creek is listed as impaired (Category 5) due to both high bacteria and low dissolved oxygen and also has documented low instream flows (Category 4).

2.4.2. Closed Depression Basins or Potholes

Edgewood contains six hydrologically isolated closed depression basins or “potholes” that have no natural outflow and are therefore prone to flooding during wet weather. As the soils in the watersheds contributing to these potholes become saturated, the water moves as surface and subsurface flow to the potholes, causing water levels to rise. About 35 percent of the total city area drains to these potholes (Kato & Warren 1997). Approximately 0.28 square miles or 180 acres) becomes inundated during periods of prolonged wet weather, such as the winter of 2016–2017, impacting almost one-third of the city due to road closures and property damage. Flooding events have occurred with regular frequency in recent years, with at least three events over the past 10 years (J. Metzler, personal communication).

All of the potholes are mapped as wetlands. There are no specific water quality standards applied to wetlands, but state antidegradation criteria require that designated uses of wetlands, such as groundwater exchange and stormwater attenuation, be protected and that hydrologic conditions and wetland vegetation be maintained. Table 2-4 describes the physical characteristics of each pothole, while Appendix B includes descriptions of stormwater-related problems associated with each pothole.

Table 2-4. Catchment Size, Pothole Size, and Flooded Area Comparison.			
Pothole Name	Size of catchment (acres)	Size of Pothole (acres)^a	1997 Flooded Area (acres)^b
Edgewood Bowl Pothole	656	86	64
Lake Chalet	136	18	13
Pinedale Pond (114th Avenue) Pothole	384	59	48
108th Avenue Pothole	226	69	30
122nd Avenue Pothole	348	18	23
Surprise Lake Pothole	74	5	4.3

Note: All sizes are approximate based on elevations.

^a Size calculated from approximate pothole boundaries at flood stage provided by the City.

^b From Kato and Warren 1997

Edgewood Bowl

The largest of the potholes is locally referred to as the Edgewood Bowl. It lies in the northeast section of Edgewood (Figure 2-4) adjacent to the Jovita Creek and North Slopes (White River) subbasins. The western border is a ridge east of Meridian Avenue North; the adjacent watershed to the west is Surprise Lake. The pothole is approximately 86 acres in size with a contributing area of approximately 656 acres. There is standing water in the bottom of the pothole for most if not all of the year.

Infiltration is limited in this pothole by the underlying compacted soil layers (Figure 2-2). During years of high precipitation, waters in the individual low areas rise and form one large area of

standing water. During bad events, roads and driveways have been closed for months at a time. In 1997, the maximum flooded area was approximately 64 acres (Kato & Warren 1997).

Lake Chalet

Lake Chalet is located in a depression in west-central Edgewood. Fed by stormwater runoff, it retains water year-round. The pothole is approximately 18 acres in size with a contributing area of approximately 136 acres. During years of high precipitation, it frequently floods the adjacent low-lying areas. In 1997, the maximum flooded area was 13 acres (Kato & Warren 1997). A culvert south of the lake carries water between the lake and an adjacent depression, but there is no outlet control.

Pinedale Pond/114th Avenue Pothole

This pothole lies immediately south of the main Edgewood Bowl pothole. The pothole is approximately 59 acres in size with a contributing area of approximately 384 acres. It is hydrologically separated from the larger pothole by a minor east-west running ridge in the vicinity of 24th Street East. The southern border is generally 32nd Street East with a short extension to 36th Street East. It exhibits the same characteristics and performance as the larger pothole. In 1997, the maximum flooded area for this pothole was approximately 48 acres.

108th Avenue Pothole

This pothole lies between the 122nd Avenue, Lake Chalet, and Pinedale Pond/114th Avenue Potholes. The pothole is approximately 69 acres in size with a contributing area of approximately 226 acres. A small area of this pothole remains wet year-round. The flat surrounding topography leads to large inundated areas: in 1997, the maximum flooded area was 30 acres.

Surprise Lake Pothole

Surprise Lake Pothole is the smallest of the Edgewood potholes and is located west of the Edgewood Bowl Pothole near Meridian Avenue and 16th Street East. The pothole is approximately 5 acres in size with a contributing area of approximately 74 acres. There is no standing water in this basin under dry weather conditions. Localized flooding can occur during heavy rainfall periods. The maximum flooded area in 1997 was 4 acres.

122nd Avenue Pothole

This smaller and steeper-sided pothole lies south of the Pinedale Pond/114th Avenue pothole. The pothole is approximately 18 acres in size with a contributing area of approximately 348 acres. Its boundaries are defined generally by 32nd Street East to the north and 43rd Street Court East to the south. It is adjacent to the steep slopes on the eastern and southern edges of the city. It has wetland plants and areas of standing water, is fed by stormwater runoff, and its

only avenues of drainage are limited infiltration and evaporation. In 1997, the maximum flooded area was 23 acres.

2.5. CRITICAL AND HAZARD AREAS

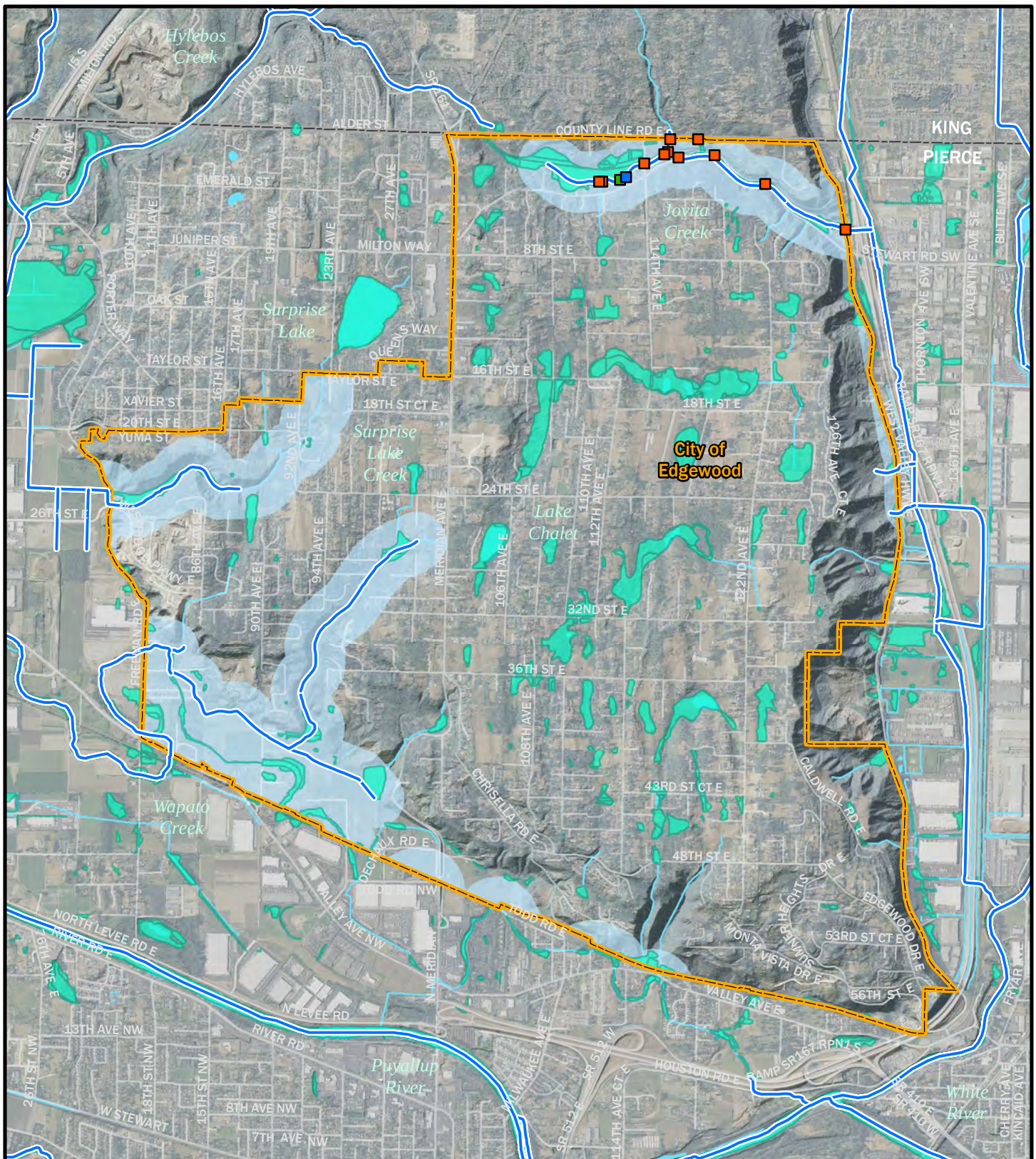
Critical areas are designated to protect natural resources and prevent harm to the community from natural hazards. The term “natural resources” typically refers to streams, wetlands, fish and wildlife habitat, wetlands, critical aquifer recharge areas (CARAs), and wellhead protection areas (WHPAs). Generally speaking, natural hazards refer to geologically hazardous areas (e.g., steep slopes) and areas at risk for flooding. Critical areas are regulated at the state and county level. Edgewood’s critical areas ordinance (CAO) (No. 17-492) was amended and adopted in 2018. The following sections describe the natural resources (groundwater, wetlands, and habitat) protected by the CAO and the natural hazard areas that have been defined to protect the public from harm.

2.5.1. Wetlands, Riparian Habitat, and Salmon Bearing Streams

Wetland, riparian habitat, and salmon bearing streams are all considered critical habitat and the City’s Critical Areas Ordinance (CAO) and municipal code (EMC 14.30. and EMC 14.40.) are the primary mechanisms used for protecting these areas.

Mapped wetlands in the city are shown on Figure 2-5. Approximately 6.5 percent of the city is mapped as wetland, including areas along the stream corridors, floodplains in the valley, and within potholes on the plateau. Table 2-5 identifies the area of wetlands for each basin. The Edgewood Bowl and 108th Avenue Pothole basins have the largest percentage of wetland of all basins within the city.

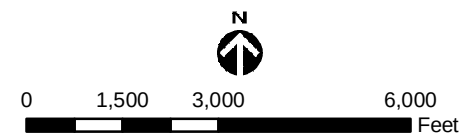
Protection of riparian habitat is of high importance in Edgewood because many of the area’s streams provide critical habitat for salmon spawning and rearing. The Washington Department of Fish and Wildlife (WDFW) fish passage website (<<http://apps.wdfw.wa.gov/fishpassage/>>) documents the presence of salmonids and barriers to fish passage. Figure 2-5 shows the stream reaches used by salmon, and barriers such as dams, weirs, and undersized culverts.



Legend

- | | | | |
|--|-------------------------------|--|-----------------------------|
| | Edgewood city limits | | Fish passage barrier (WDFW) |
| | County boundary | | Road crossing |
| | Wetland (City of Edgewood) | | Dam |
| | Stream corridor | | Miscellaneous barrier |
| | Stream reaches used by salmon | | |

Figure 2-5.
Wetlands and Salmon Bearing Streams.



USDA, Aerial (2015)

Source: Washington Department of Fish and Wildlife

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Table 2-5. Critical Areas in Edgewood Drainage Basins.																
Basin Group/Subbasin	Wetland		Stream Corridor		WHPAs		Vulnerable ARAs		Steep Slopes (>20%)		Steep Slopes (>40%)		FEMA 100 year Floodplain		Flood Hazard Area	
	(ac)	(%)	(ac)	(%)	(ac)	(%)	(ac)	(%)	(ac)	(%)	(ac)	(%)	(ac)	(%)	(ac)	(%)
White River Basin																
North Slopes	7.5	3%	29.8	11%	1.4	1%	3.7	1%	138.2	50%	9.9	3%	0.0	0%	0.0	0%
Central Slopes	2.7	4%	0.0	0%	0.0	0%	1.0	1%	46.1	61%	2.3	3%	0.0	0%	0.0	0%
Southern Slopes	1.2	1%	0.0	0%	0.0	0%	0.5	0%	53.7	28%	6.0	5%	0.0	0%	0.0	0%
Jovita Creek Basin																
Jovita Creek	59.0	9%	224.3	36%	434.3	70%	7.4	1%	60.1	10%	9.7	2%	12.6	2%	12.6	2%
Puyallup River Basin																
Upper Wapato Creek	16.9	4%	27.3	6%	4.7	1%	13.2	3%	107.3	24%	4.0	1%	0.0	0%	1.4	0%
Wapato Creek Basin																
Lower Wapato Creek	23.1	4%	177.4	31%	370.4	64%	181.1	31%	68.6	12%	4.2	1%	55.7	10%	75.8	13%
Simons Creek Basin																
Simons Creek	13.7	3%	233.6	44%	503.4	95%	37.7	7%	52.4	10%	6.6	1%	24.3	5%	24.3	5%
Tributary to Simons Creek	10.6	4%	78.1	30%	238.7	91%	56.6	22%	21.6	8%	1.0	0%	14.5	6%	18.1	7%
Hylebos Creek Basin																
Surprise Lake Creek	15.8	3%	216.9	46%	63.3	13%	2.2	0%	89.0	19%	8.6	0%	13.5	3%	13.5	3%
Surprise Lake	3.0	5%	0.0	0%	34.9	56%	0.0	0%	0.5	1%	0.0	0%	0.0	0%	0.0	0%
Hylebos Creek	0.0	0%	0.0	0%	0.7	16%	0.0	0%	0.6	13%	0.0	0%	0.0	0%	0.0	0%
Pothole Basins																
Edgewood Bowl Pothole	88.9	14%	0.0	0%	634.6	97%	0.0	0%	5.4	1%	0.0	0%	0.0	0%	70.5	11%
Lake Chalet Pothole	11.1	8%	0.0	0%	136.0	100%	0.0	0%	0.8	1%	0.0	0%	0.0	0%	19.8	15%
Pinedale Pond/114th Avenue Pothole	30.0	8%	0.0	0%	357.5	93%	0.0	0%	2.0	1%	0.0	0%	0.0	0%	45.8	12%
108th Avenue Pothole	30.8	14%	0.0	0%	225.9	100%	0.0	0%	0.6	0%	0.0	0%	0.0	0%	31.3	14%
122nd Avenue Pothole	25.5	7%	0.0	0%	234.2	67%	0.0	0%	1.7	0%	0.0	0%	0.0	0%	32.6	9%
Surprise Lake Pothole	5.7	8%	0.0	0%	67.4	91%	0.0	0%	1.1	1%	0.0	18%	0.0	0%	4.3	6%
Total	345.6	6%	987.4	18%	3,307.5	62%	303.5	6%	649.6	12%	52.3	1%	120.7	2%	350.1	7%

Within Edgewood, there are four streams with documented fish presence:

- Surprise Lake Creek and Jovita Creek support Fall Chinook and Pink Salmon;
- The unnamed tributaries in the Central Slopes subbasin support Pink Salmon, Fall Chinook, Fall Chum, and Winter Steelhead;
- Simon's Creek supports Coho and Fall Chum; and
- Wapato Creek supports Coho, Fall Chinook, and Fall Chum.

There are 13 inventoried fish passage barriers in the city, all associated with Jovita Creek.

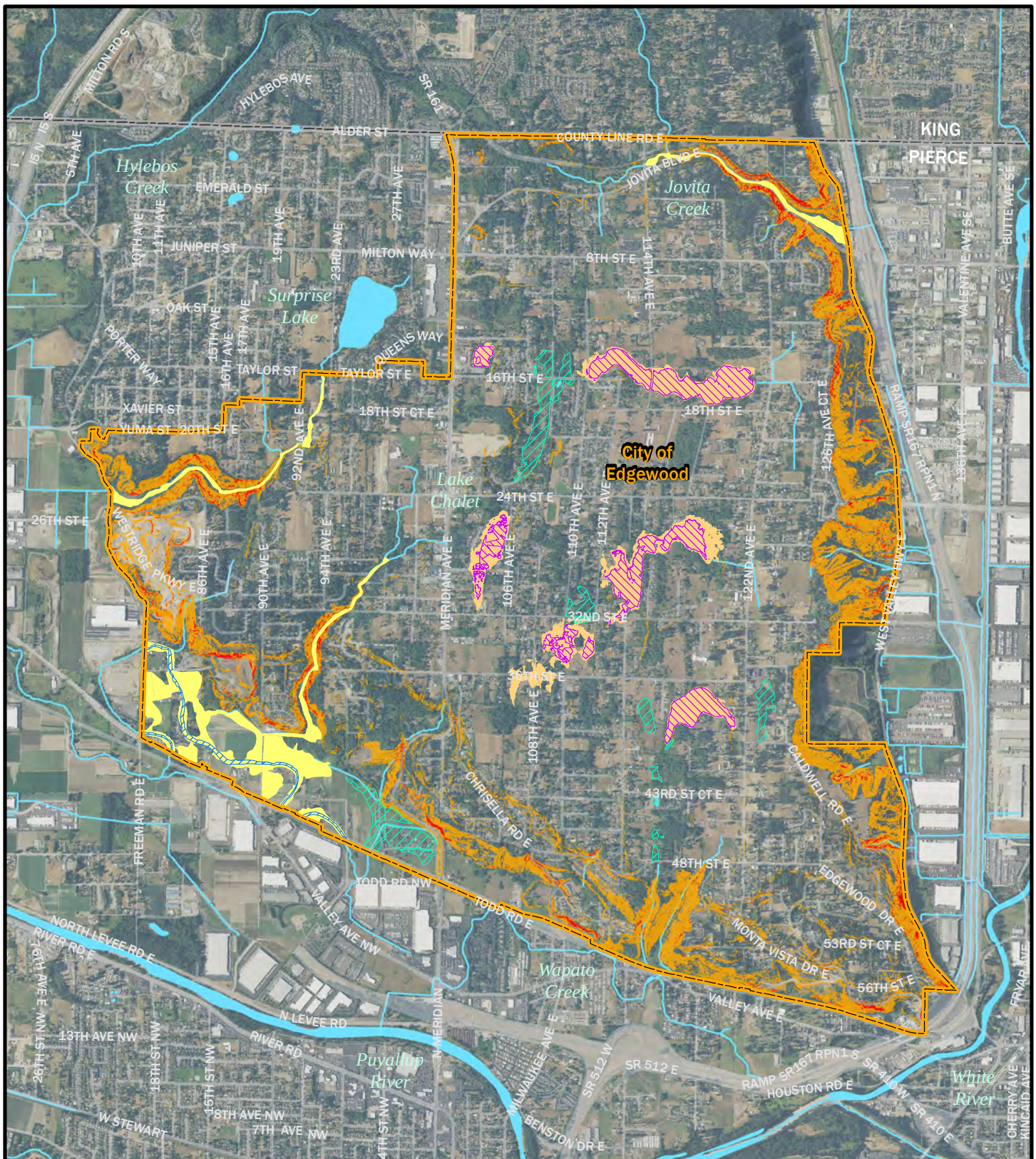
2.5.2. Natural Hazards

Natural hazards are defined in the CAO and designated pursuant to Chapter 14 EMC. The most pertinent natural hazards affecting stormwater planning and development are flood and landslide hazard areas.

Landslide Hazards and Steep Slopes

Landslide hazard areas are defined as areas potentially subject to land regression or retreat due to a combination of geologic, seismic, and/or hydrologic or manmade factors, such as vegetation loss, soil type, slope instability, and hydrology. Steep slopes, defined as areas between 20 and 40 percent slope and greater than 40 percent slope, were also calculated and mapped for the City (Figure 2-6).

Steep slopes are mapped along much of the eastern and southern edges of the city and are associated with the stream and drainage corridors that convey water from the plateau area to the valley bottom (Table 2-5 and Figure 2-6). In total, approximately 23 percent of the city is classified as having steep slopes greater than 20 percent and 1 percent of the city is classified as having steep slopes greater than 40 percent (Table 2-5). There are three basins where steep slopes (greater than 20 percent) comprise more than 50 percent of the area: Central Slopes, North Slopes, and Southern Slopes. Stormwater infiltration based BMPs can exacerbate landslide hazards, thus this data needs to be considered during stormwater project development.

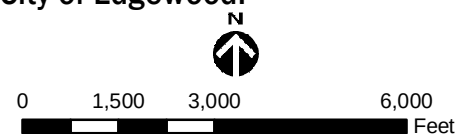


Legend

- | | |
|-------------------------------------|-------------------------|
| Edgewood city limits | Steep slopes (20 - 40%) |
| County boundary | Steep slopes (>40%) |
| City-identified flood hazard areas | Waterbody |
| FEMA floodway | |
| City-identified floodway | |
| FEMA 100-year floodplain | |
| City-identified 100-year floodplain | |

Source: City of Edgewood

Figure 2-6.
Mapped Flood and Landslide Hazards in the City of Edgewood.



USDA, Aerial (2015)

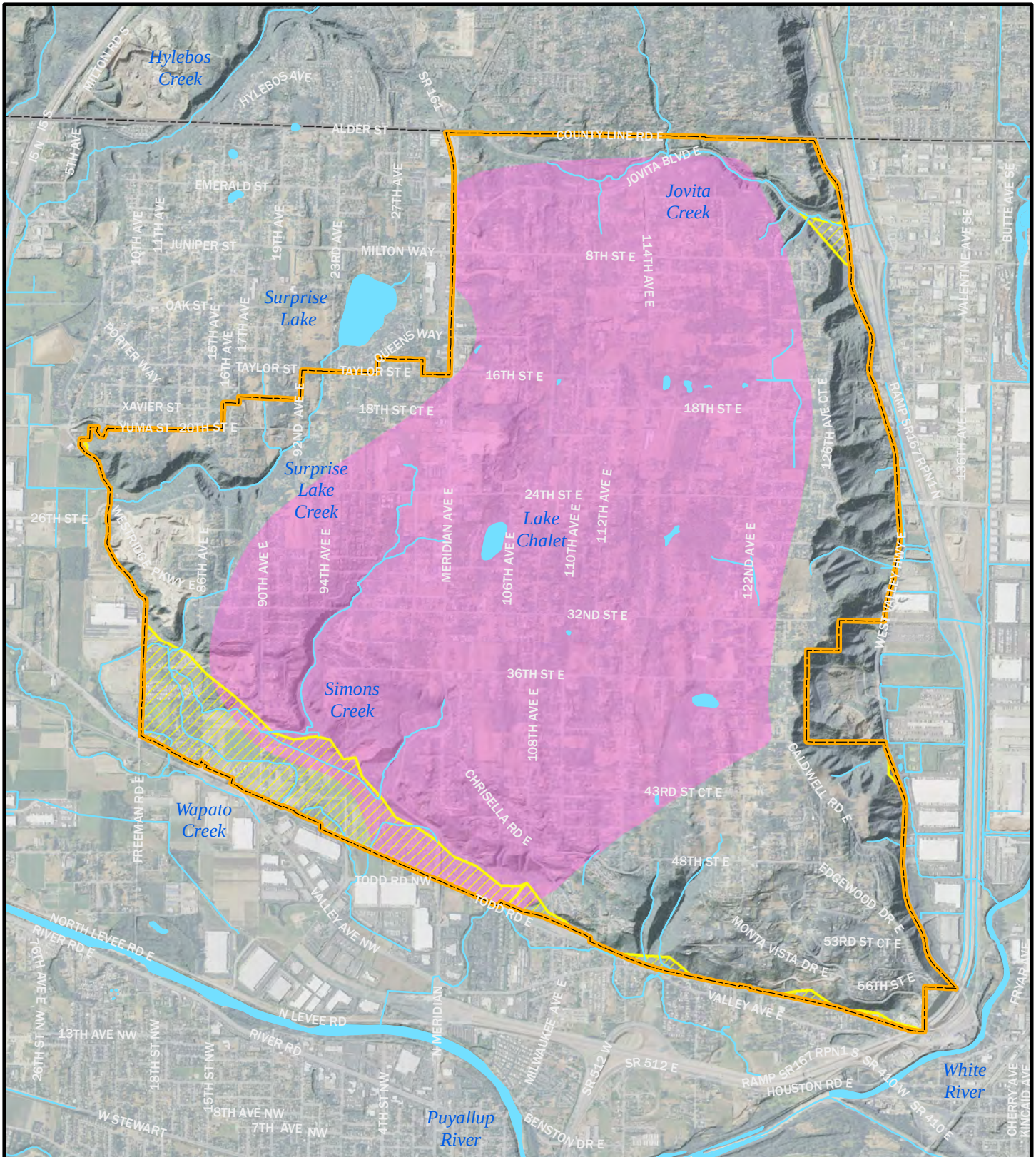
Flood Hazards

The Federal Emergency Management Agency (FEMA) designates flood zones (floodways and floodplains) based on predicted flood recurrence intervals. The 100-year floodplains as designated by FEMA are mapped on Figure 2-6. This includes areas that may be flooded by rivers during high flow conditions. Riverine flooding is a significant concern in the Jovita Creek, Simons Creek, and Surprise Lake Creek basins, where streams discharge from steep slopes to flow across relatively flat valleys, but this includes only 2 percent of the city. FEMA floodplain mapping does not account for the flood hazards related to the pothole basins. These are flooded much more frequently than the 100-year frequency used by FEMA and have a different, local designation as flood hazards. About 6.6 percent of the city is classified as a flood hazard, as shown in Figure 2-6 and Table 2-5. As described previously, flooded areas associated with the potholes can impact up to 30 percent of the city due to road closures.

2.5.3. Groundwater Resources

Groundwater resources are an important consideration for stormwater planning efforts, because many stormwater management strategies that rely upon infiltration have the potential to influence groundwater quality. The local water purveyor, Mountain View-Edgewood Water Company (MTVE), relies on groundwater for its sole source of supply (Engineering Consultants Northwest 2017), and has won awards for the quality of their drinking water. A Wellhead Protection Plan developed for MTVE (Robinson-Noble 2005) lays out the major components for source protection, including a susceptibility assessment, a delineated wellhead protection area, a spill response plan, and contingency plans.

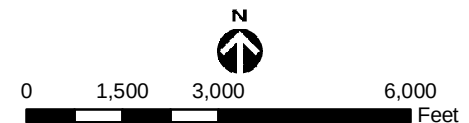
Vulnerable Aquifer Recharge Areas (VARAs), defined as areas with a critical aquifer recharging effect on aquifers used for potable water, and wellhead protection areas (WHPAs) defined as a surface and subsurface land area regulated to prevent contamination of a well or well-field supplying a public water, have recently been adopted by the City during an update of their Critical Areas Ordinance. As shown in Table 2-5, 6 percent of the city is within a VARA. These are concentrated in the valley along Wapato Creek in the southwest area of the city with a smaller area in the floodplain of Jovita Creek. Approximately 62 percent of the city is within a designated WHPA for the MTVE wells. Designated WHPAs and VARAs within the city are shown on Figure 2-7.



Legend

-  Edgewood city limits
-  County boundary
-  Vulnerable aquifer recharge area
-  Wellhead protection area
-  Waterbody
-  Stream

Figure 2-7.
Vulnerable Aquifer Recharge Areas
and Wellhead Protection Areas.



Source: City of Edgewood

2.6. EXPECTED FUTURE CONDITIONS

2.6.1. Climate Change

Predicted Climate Changes

Significant research on climate change predictions has been conducted by the Climate Impacts Group (CIG) at the University of Washington. This research projects the local effects of global climate change using 20 global climate models and two greenhouse gas emissions scenarios. Local climate impacts are identified by downscaling model results and supplementing data with regional climate models.

Some general, stormwater-related predictions for the Puget Sound area for the next 50 years include (Mauger et al. 2015):

- There are no statistically significant trends toward wetter or drier conditions.
- Future occurrences of heavy rainfall are projected to be more frequent and more intense and will exacerbate flooding in many areas.
- Seasonal, year-to-year, and decade-to-decade variations will remain an important feature of local climates.
- There is a projected increase in landslide risk, erosion, and sediment transport during wetter months.
- For rain dominant watersheds, projected streamflow changes are less dramatic than those watersheds closer to the snowline.

Table 2-6, summarizes CIG's most recent climate change predictions for the watershed that contains the Edgewood area (Mauger et al. 2015). As shown, predictions indicate that average winter and summer temperatures will increase, winter precipitation and runoff will increase, and summer precipitation and runoff will decrease. Peak flows were not predicted for the streams within Edgewood; however, the general prediction for most of the Puget Sound basin is an increase in the magnitude and frequency of these flows.

Table 2-6. Predicted Climate Change for Edgewood Area (interpreted from Mauger et al. 2015).			
Climate Component	Historical	Lower Emission Rate Scenario	Higher Emission Rate Scenario
Average Winter Temperature	38 to 43 (degrees F)	+2 to +3 (change degrees)	+ 4 to +5 (change degrees)
Average Summer Temperature	60 to 64 (degrees F)	+3.9 to +5.6 (change degrees)	+5.6 to +7.2 (change degrees)
Winter Precipitation	34 to 45 (inches)	+7 to +8.5% (percent change)	+8.5% to +10% (percent change)
Summer Precipitation	8 to 12 (inches)	-8 to -6% (percent change)	Unknown ^a
Maximum 24-Hour Precipitation	1.6 to 2.3 (inches)	+10 to +15% (percent change)	+15 to +20% (percent change)
Summer Water Deficit	4 to 9 (inches)	+1 to +2 (change inches)	+1 to +2 (change inches)
Winter Runoff	18 to 24 (inches)	0 to +20%	0 to +20%
Summer Runoff	0 to 8 (inches)	-10% to 0%	-10% to 0%

^a Unknown: The projected changes are based on 10 different global climate models. If there was less than 80 percent agreement between the models on the direction of change, then the results are reported as unknown.

These predicted climate changes would alter stream flows, flood risk, water quality, and habitat as shown in Table 2-7. Increased winter precipitation will increase flood risk, including risk of surface water flooding in potholes and stormwater conveyance. It could also increase the risk of groundwater induced flooding. The summertime increases in air temperature will result in an increase in the number of growing degree days in addition to overall increases in evaporation and transpiration, thus increasing the potential for future summer water deficits. This in turn means both a reduction in the amount of water that is available to recharge groundwater during the summer months as well as increased removal from groundwater supplies. Many wetlands located in the upland potholes serve as habitat for waterfowl and may be threatened by increased dry periods in the summer. Cold water fish using streams leading from the plateau may be threatened by increased temperatures and reduced dissolved oxygen and flow.

Table 2-7. Expected Responses to Stormwater Management Components from Predicted Climate Change Effects.	
Stormwater Management Component	Predicted Response to Climate Change
Stream Flows	Increased winter flows Decreased summer flows Likely Increased magnitude and frequency of peak events
Groundwater Supply	Decreased recharge during summer months Increased use during summer months
Flood Risk	Increased flood risk from rivers, streams, and stormwater conveyance system Possible increase in groundwater induced flooding Increased flood risk from channel migration
Water Quality	Increased average and summer water temperature Increased erosion and suspended materials Lower dissolved oxygen Increased algal blooms
Habitat	Wetland conversion from perennial to seasonal Possible loss of streamside vegetation Decrease in cooler/oxygenated water habitats

2.6.2. Population Growth and Annexations

Population growth and new annexations can result in a further strain for stormwater management programs. While both population growth and annexations would bring additional revenue to the stormwater utility, increased populations result in more impervious area and therefore more runoff and more pollutant sources. Annexations result in an expansion of the service area and likely a new set of existing drainage system problems and resource constraints.

The 2010 Census estimate of the city's population was 9,387. Edgewood's estimated population in 2015 was 10,734, representing a 9 percent growth over the six-year period (US Census Bureau 2016). According to the City of Edgewood's 2015 Comprehensive Plan, the population is expected to grow to 13,700 by 2035 (Edgewood 2015). There are no current plans for annexations, and a large part of the city is bounded by other cities, so this is not generally a concern for stormwater planning in Edgewood.

2.7. STORMWATER SYSTEM CHARACTERISTICS

2.7.1. Stormwater System Features

The City's Stormwater Utility manages a large and complex storm drainage system that consists of underground pipes, open ditch conveyance, stormwater treatment features and more as summarized in Table 2-8. While some of this system drains to wetlands and ponds within closed depressions that infiltrate to groundwater, most of the conveyance network directs stormwater from the plateau to the Puyallup River valley. A map of the City's stormwater system is provided in Figure 2-8.

Table 2-8. Summary of Key Features of the City of Edgewood's Stormwater System.	
Item	Quantity^{a,b}
Catch Basins	523
Manholes	19
Control Structures	56
Vaults	10
Drywells	54
Detention Ponds ^c	4
City Storm System Pipes	22 miles
City Storm System Channels	28 miles

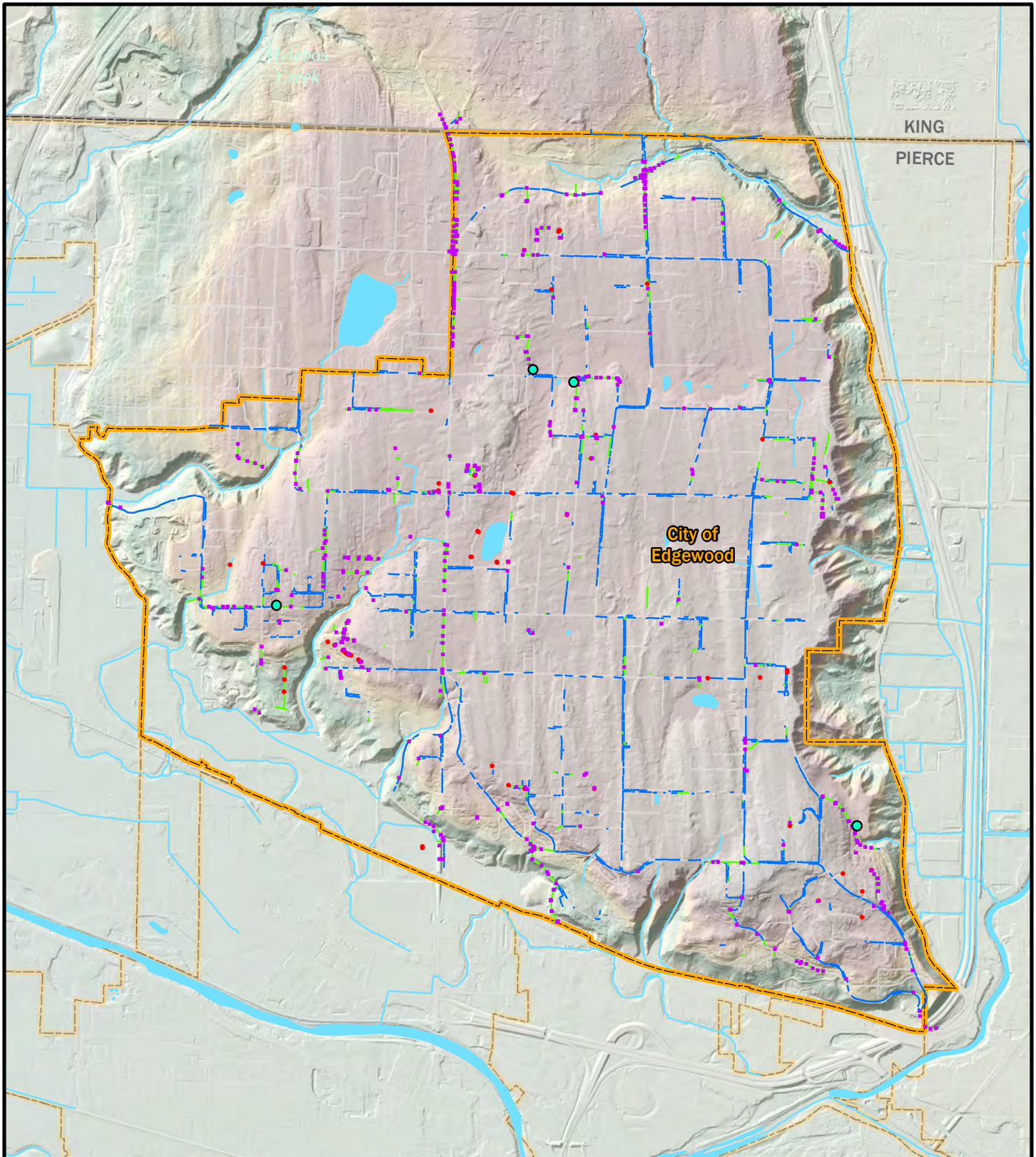
^a Based on City of Edgewood GIS data provided in 2017.

^b Feature count includes only City-owned features. Stormwater features with "Null" values for ownership are excluded from feature summary.

^c The City's mapped data does not include stormwater ponds, although mapped pipes and channels discharge to public ponds. These pipes were identified and checked using aerial photos to identify unmapped ponds and ponds fed by multiple pipes.

2.7.2. Stormwater System Maintenance

A majority of Edgewood's municipal maintenance and inspection activities that are required by the Permit are performed by Pierce County Public Works crews through an interlocal agreement (ILA) between the City and Pierce County Public Works and Utilities Department. As part of this agreement, the City specifies a list of work to be completed each year, including street sweeping, Vector services, and small engineering projects. The County also provides services to the City on an on-call basis, though these requests may be denied under special circumstances such as extreme weather events.

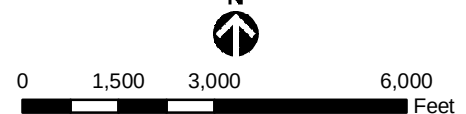


Legend

- | | |
|--|--|
|  Edgewood city limits |  Public pipe |
|  County boundary |  Channel |
|  City limits |  Catch basin |
|  Roads |  Dry well |
|  Waterbody |  Public stormwater pond |

Source: City of Edgewood

Figure 2-8.
Mapped Stormwater System Infrastructure
in the City of Edgewood.



USDA, Aerial (2015)

3. IDENTIFIED PROBLEMS AND RECOMMENDATIONS

Review of previous stormwater plans and information obtained during a workshop with City staff was used to develop an initial list of problems to be evaluated during work on this plan. These problems were evaluated using desktop methods and limited field evaluation to assess site-specific opportunities and constraints. To address the problems, 14 capital improvement program (CIP) project solutions are included in this plan. Two of the listed CIP projects represent multiple projects; these are the City's annual spot improvement program to address small localized flooding issues and pothole reduction plans, which would eventually address flooding in five different potholes. Figure 3-1 shows approximate project locations, not including projects associated with the City's spot improvement program.

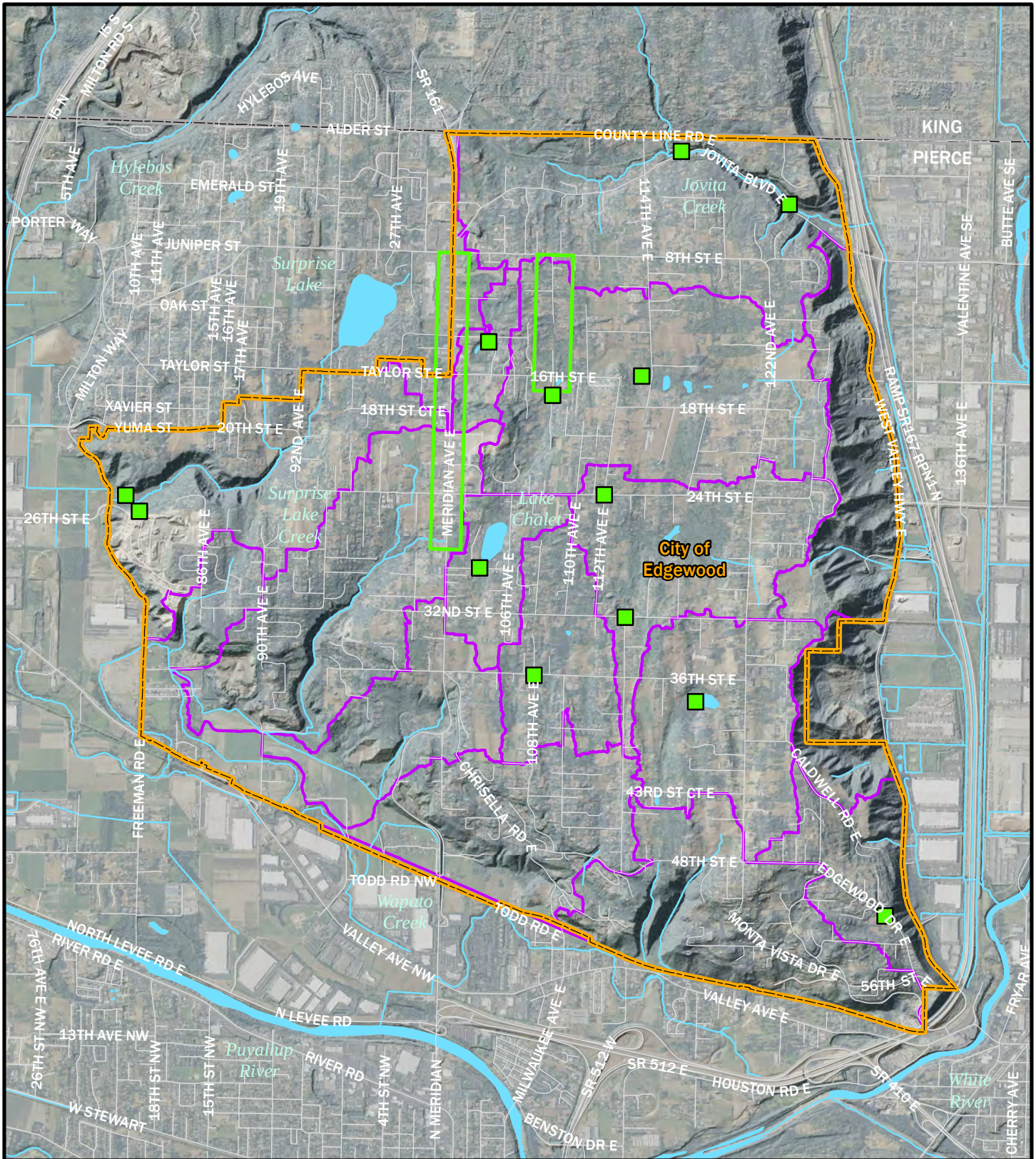
The projects fall into three categories; Pothole Flooding, Stream Planning and Protection, and Other Localized Flooding, as organized below. Project summary sheets, conceptual figures, and cost estimates are included in Appendix C for seven of the projects that were considered a potentially high priority.

3.1. POTHOLE FLOODING

Edgewood's six potholes receive stormwater runoff from surrounding neighborhoods and frequently flood during the winter months. This flooding is extensive and impacts a large portion of the city; during the winter of 2017 it impacted over 30 percent of the city and caused complete closure of multiple roadways for 32 consecutive days. A detailed alternatives assessment for addressing this stormwater problem was performed as part of developing the City's 1997 surface water management plan, but no clear solution was identified to address the problem.



Flooding of the Edgewood Bowl Pothole causes road closures.



Legend

- Edgewood city limits
- Subbasin boundary
- County boundary
- CIP Study Area
- CIP Locations
- Waterbody
- Stream
- Road

Figure 3-1.

Locations of Proposed Stormwater Capital Improvement Projects.



0 1,500 3,000 6,000
Feet



USDA, Aerial (2015)

Pothole flooding remains the most significant stormwater-related issue in Edgewood; and given anticipated future development and projected wetter winter climate (See Section 2.5), the problem will likely increase in severity unless flood reduction strategies are implemented. One potential option for addressing this is to send treated stormwater to underground aquifers. Since there are some critical issues to evaluate before this option can be considered, a feasibility assessment for the Edgewood Bowl pothole is the first listed project. Depending upon the outcome of the feasibility assessment, a pilot project, i.e., the Infiltration Pilot Project Design and Construction project, would be completed to field test the application. Flood reduction studies would then be undertaken to develop detailed plans for five of the potholes. These plans will develop a preferred strategy for each pothole, which could include regional infiltration facilities, land acquisition, and upland stormwater management, or a combination of these. Completing the infiltration feasibility assessment and pilot project before development of individual flood reduction plans will allow consideration of regional infiltration facilities as a flood reduction option, if it is determined that they provide appropriate safeguards for existing drinking water supplies, are cost effective, and are supported by stakeholders.

For Lake Chalet, the sixth pothole, a solution has already been identified that involves routing water through new and existing pipes to Simon's Creek, which was the natural overflow route for this pothole prior to modern development. Three alternatives for routing the water from Lake Chalet have been considered, and each is included as a project summary sheet in Appendix C.

Table 3-1 lists all the CIP project solutions proposed to address pothole flooding. As stated above, implementation of the Infiltration Pilot Project Design and Construction project would be contingent upon the results from the Edgewood Bowl Pothole Pilot Project Feasibility Assessment. Both projects would be coordinated with the MTVE.

A brief description of the specific flooding problems associated with each pothole is provided below.

Table 3-1. CIP Projects Identified to Address Pothole Flooding.^a		
Project Title	Summary	Cost
Edgewood Bowl Pothole Pilot Project Feasibility Assessment	Assess the feasibility of using stormwater treatment and infiltration through an underground injection control (UIC) wellfield to reduce flooding in the Edgewood Bowl Pothole. This project includes monitoring water levels and water quality of the potholes.	\$460,000
Lake Chalet Pothole Flood Reduction Project	Convey water out of the pothole to reduce water surface elevation during flooding events.	\$400,000 to \$2,000,000 (Cost range reflects differences of using pumped flow, gravity flow, or horizontal directionally drilled siphon alternatives.)
Infiltration Pilot Project Design and Construction	Design and construct a pilot project to demonstrate the effectiveness of using stormwater treatment and infiltration through an underground injection control (UIC) wellfield to reduce flooding in the Edgewood Bowl Pothole.	\$1,900,000 (Implementation is dependent upon results of Edgewood Bowl Pilot Project Feasibility Assessment)
Pothole Flood Reduction Plans	Develop and evaluate alternatives to address flooding in five of the potholes (not including Lake Chalet, which is addressed through a different project).	\$850,000 (\$170,000 per pothole)

^a See Appendix C for project summary sheets, figures, and cost estimates related to these CIP projects.

3.1.1. Edgewood Bowl Pothole

Edgewood Bowl Pothole is the highest priority pothole because it is the largest in terms of contributing area and flooded area. In 1997, 10 individual flooding problems were associated with Edgewood Bowl Pothole, including three areas of road closures (110th Avenue East, 16th Street East, and 114th Avenue East) and private property damage such as flooded crawl spaces, septic systems, drywells, and driveway erosion. In addition to property damage and safety issues caused by the flooding, wetlands associated with the pothole may be impacted by the water level fluctuation. The feasibility assessment and pilot projects listed in Table 3-1 are currently planned to occur in the Edgewood Bowl Pothole because it is the City's highest priority.

3.1.2. Lake Chalet Pothole

Flooding associated with the Lake Chalet Pothole affects many septic systems in the frequently flooded region near the pothole, and there are two drinking water wells near the pothole. In addition to these water quality concerns, 29th Street East is frequently closed due to flooding and two adjacent private properties are impacted. Projects in the Lake Chalet Pothole include monitoring to evaluate water quality and hydrologic conditions and a project to convey water from Lake Chalet to Simon's Creek to control flooding (Table 3-1). A flood reduction study is not currently planned for this pothole; however, if the currently proposed conveyance project is

found to be infeasible, a flood reduction study will be needed. Any flood reduction project that drains water from this pothole will need to address the volume of water that needs to be controlled and the frequency and duration of discharge to evaluate potential downstream impacts as well as impacts on groundwater recharge.

3.1.3. Pinedale Pond/114th Avenue Pothole

There are several flooding problems associated with this pothole: seasonal flooding is experienced on eleven private properties and three roadways are on the flood fringe (117th Avenue East, 112th Avenue East, and 32nd Street East). Flooding of this pothole also affects associated wetland areas.

3.1.4. 108th Avenue Pothole

The 108th Avenue Pothole is located close to the Pinedale Pond/114th Avenue Pothole with similar challenges and a lack of water quality data for ponded areas and wetlands. There are five flooding problems associated with this pothole: two private properties and three roadways (108th Avenue East, 32nd Street East, and 36th Street East).

3.1.5. Surprise Lake Pothole

Surprise Lake Pothole is the smallest of the Edgewood potholes. There is flood risk for two houses and one septic system, which is a water quality concern.

3.1.6. 122nd Avenue Pothole

The 122nd Avenue Pothole has steeper slopes surrounding it that limit the area affected when the water level rises. Although the 1997 plan identified private homes, driveways, and buildings flooded along 122nd Avenue East, only one private driveway has been impacted by the rising water levels recent years.



Mortensen Farm wetland restoration site.

3.2. STREAM PLANNING AND PROTECTION

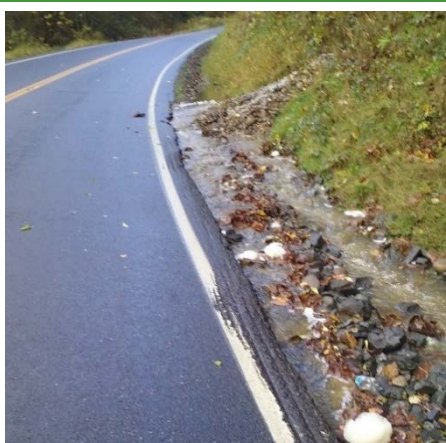
Two projects have been identified to restore and protect local streams that will require planning and assessment before specific solutions can be identified, these are listed in Table 3-2. The Jovita Creek project will require extensive coordination with other local jurisdictions before a protection and restoration plan can be developed. The Mortenson Farm site has been identified as a possible mitigation site by the Washington State Department of Transportation to mitigate for the impacts from future construction of the SR 167 Extension project. Therefore, this will also

require coordination but may likely be partially funded by the Washington State Department of Transportation.

Table 3-2. CIP Projects Related to Stream Protection and Planning.		
Project Title	Summary	Cost
Jovita Creek Regional Improvement Feasibility Study ^a	Develop a plan for the Jovita Creek basin that will define actions to address flooding, slope stability, erosion, water quality, and habitat health.	\$500,000
Mortenson Farm Regional Stormwater Improvements	WQ Improvements, Stream Channel Restoration, Regional Detention Evaluation, Wetland Enhancement, Passive Recreation	TBD (Coordinating with WSDOT as part of SR 167 Mitigation)

^a See Appendix C for project summary sheet, figure, and cost estimate related to this CIP project.

3.3. OTHER IDENTIFIED FLOODING PROJECTS



Stormwater runoff on the side of Jovita Boulevard in Edgewood transports pollutants and can damage the roadway.

There are localized, nuisance flooding problems that are caused by such things as undersized culverts, erosion from steep slopes, deteriorating infrastructure, lack of maintenance of stormwater facilities, and/or changes to land use or the drainage network on adjacent or nearby property. If these problems are on City property or are a result of problems with City-controlled infrastructure, they can be addressed over time as part of a long-term repair and rehabilitation program, other related infrastructure upgrades (e.g., roadway repairs), or stand-alone projects in the CIP plan. Table 3-3 lists CIP projects that address identified, localized flooding problems. The first listed project, “City Drainage Infrastructure Program/Spot Improvements” is not a specific project but addresses this long term need.

Table 3-3. CIP Projects Related to Localized Flooding.		
Project Title	Summary	Cost
City Drainage Infrastructure Program/Spot Improvements	Ongoing annual program to identify and address small localized drainage problems.	\$100,000 (annual cost)
108th Avenue East/ 36th Street East Road Flooding	Evaluate alternatives and implement a project to prevent roadway flooding.	\$1,000,000
24th/112th Seasonal Ponding	Shoulder and culvert improvements to resolve seasonal flooding and dangerous roadside conditions.	\$175,000
108th Avenue East/ 8th to 16th Flooding	Improving collection and conveyance system on dead-end road; handling public runoff to reduce private property flooding.	\$350,000
Edgewood Drive East Drainage Improvements ^a	This project will improve conveyance to reduce roadway and property flooding during large storm events.	\$860,000
25th Street East Drainage Improvements ^b	Stabilize and repair slide damage to prevent slides, shoulder erosion, and roadway flooding in the future.	\$200,000
Jovita Boulevard Rehabilitation	Reconstruct existing roadway to protect slopes, prevent erosion, and preserve storm drainage conveyance.	\$500,000
Meridian Avenue Corridor Study	Recent widening between 8th Street East and 24th Street East isolated properties on the east side, making surface water improvements prohibitive in some cases. Opportunities to restore natural drainage pathways are needed.	\$50,000

^a See Appendix C for project summary sheet, figure, and cost estimate related to this CIP project.

^b This roadway segment is now closed to traffic, and the City is re-evaluating the design solution for this site.

As is the case in most jurisdictions, there are also localized flooding problems that stem from private property, such as where drainage patterns have been changed resulting in damage to adjacent or downstream private properties. The City has limited jurisdiction on private property and is further constrained by laws that prohibit the use of public funds for private benefit. The City should develop a protocol for addressing flooding or stormwater discharge issues associated with private property. The protocol should include outreach to adjacent property owners and education on responsibilities and follow-up activities. The City may also want to consider identifying these problems on property tax assessments or use other mechanisms to alert potential property owners during property transactions.

3.4. PROGRAM REVIEW AND UPDATES

Stormwater program priorities and needs are continually changing. The following provides a list of steps that should be scheduled to occur routinely to ensure efficiency of the City's overall stormwater program.

Recommendations

- Develop and maintain a list of known drainage problems and encourage field staff to contribute to the list on a quarterly basis, especially after storm events when they may have noted problems in the field.
- Annually review CIP projects planned by other departments to make more efficient use of limited resources by combining projects from multiple departments.
- Consider flow control and water quality retrofits through modification of existing facilities or LID development practices as part of projects programmed through other departments.
- Add flow control and water quality retrofit CIP projects or neighborhood drainage improvement CIP projects to the site-specific problems list.
- Revise this Comprehensive Stormwater Plan at least every 5 years, to ensure that it provides for effective long-term stormwater project planning, system maintenance, response to mandates, and program funding.
- Ensure the City's stormwater manual is regularly updated and ensure all City and private projects conform with the City's adopted stormwater requirements.

4. STORMWATER MANAGEMENT PROGRAM

This section includes a summary of stormwater management program needs. It includes those programmatic needs that are driven by regulations (i.e., the NPDES Phase II Permit [Permit] and State UIC guidelines) and the City's goals and policies that pertain to the stormwater program as listed in Section 1.3. A detailed Gap Analysis and Needs Assessment related to Permit compliance was completed as a part of development of this plan and is included as Appendix A.

4.1. NPDES PHASE II PERMIT COMPLIANCE

The most significant regulatory requirement facing the City's SWMP is the NPDES Phase II Permit (Ecology 2013), which addresses a variety of issues associated with stormwater runoff and requires the City to develop several distinct stormwater management program components. The City's current Stormwater Management Program (SWMP) is designed to achieve compliance with the Permit, to minimize the adverse impacts of stormwater on the natural and built environments (i.e., preventing flooding, reducing flow rates, and improving water quality), and meet the goals and policies outlined above.

As one of the first tasks in development of this plan, the City's SWMP activities and documentation were reviewed (based on information provided in 2016) to identify gaps in the existing SWMP. The primary focus of this effort was to evaluate the program against requirements of the Permit; however, other program needs have also been included if they were identified as goals in the Citywide Edgewood Comprehensive Plan, by City staff, and by the consultant team based on experience in other jurisdictions. The Gap Analysis and Needs Assessment (Gap Analysis) in Appendix A provides a detailed review of the City's activities as they pertain to the Permit and provides recommendations on filling the gaps in stormwater program coverage along with estimated costs for doing so. This section is intended as an overview of the findings and includes all recommendations from the Gap Analysis.

The current Permit specifies requirements for the following stormwater program components:

- Public education and outreach
- Public involvement and participation
- Illicit discharge detection and elimination (IDDE)
- Controlling runoff from new development, redevelopment, and construction sites

- Municipal operations and maintenance
- Compliance with Total Maximum Daily Load (TMDL) Requirements
- Monitoring and Assessment
- Reporting Requirements

Recommendations associated with each of these components are provided in the following sections. Chapter 5 provides an estimate of the additional staff and equipment resources that will be required to implement the entire program.

4.1.1. Public Education and Outreach

This SWMP program component provides education and outreach to the general public and businesses. The gap analysis and needs assessment identified a number of areas where the City should expand their education and outreach program.

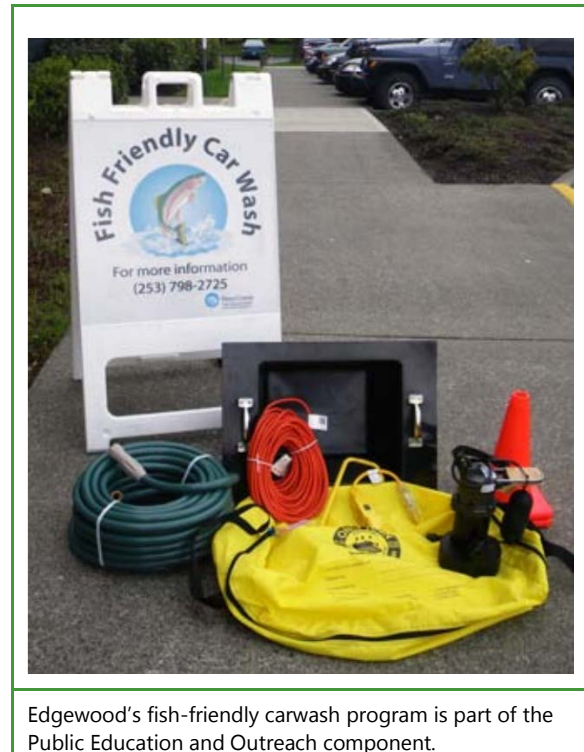
Recommendations

Required by Current Regulations

- Conduct a survey to evaluate the effectiveness of the City's targeted education program. The City has identified engineers, developers, and contractors as their target audience and chosen "technical standards for stormwater site development" and "LID techniques" as subject areas to promote stormwater education and has developed an educational handout to support the program. The remaining need is to evaluate the program's effectiveness and then to revise the handout based on survey findings.
- Identify and implement a stewardship program such as tree planting events, rain barrel distribution, catch basin marking, or coordination with other stewardship programs such as the Pierce Conservation District's Stream Teams.

Recommended Program Improvements

- Continue hosting community workshops for stormwater issues.
- Identify regional partners and educational programs and include links to these on the City website (Examples are provided in Appendix A.)



Edgewood's fish-friendly carwash program is part of the Public Education and Outreach component.

- Implement the following activities as identified in the 2017 SWMP:
 - o Work with Puyallup School District to support stormwater education opportunities
 - o Work with the Pierce County Parks' Conservation Futures grant program to preserve sensitive areas
- Finalize educational handouts for paving contractors

4.1.2. Public Involvement and Participation

The City's program ensures that there is ample opportunity for the public to understand and comment on issues related to stormwater management in the city. No gaps or improvement needs were identified for this program component.

4.1.3. Illicit Discharge Detection and Elimination (IDDE)

The City meets the IDDE requirements of the Permit, primarily through inspections conducted by Pierce County staff through an Interlocal Agreement (ILA). In accordance with the ILA, Pierce County staff inspect and clean catch basins, which could detect illicit discharges, and conduct response (elimination) work if requested to support IDDE needs of the Permit. The program also includes mapping and inventorying the stormwater system, development of an ordinance to prohibit illicit discharges, and a tracked training program for staff to identify and detect illicit discharges.

A number of permit requirements have not yet been met for this Permit component. The most significant gap in program coverage is related to the requirement to map the tributary areas associated with outfalls and discharge points of 24 inches or more in diameter, which is required by February 2, 2018. The City has initially identified five outfalls and begun the mapping of the tributary areas, but based on a desktop analysis of the stormwater system, it is likely that a number of other points in the system should be classified as outfalls or discharge points. The Permit defines "outfalls" as points (ends of pipes or ditches) where stormwater leaves the City's system and enters a surface water and "discharge points" as points where discharge leaves the system through facilities or BMPs designed to infiltrate (See the Permit for complete definitions).

Recommendations:

Required by Current Regulations

- Map the tributary areas associated with known outfalls and discharge points of 24 inches or more in diameter.
- Continue the outfall inventory to include all locations where pipes and ditches discharge to potholes, wetlands, ponds, or streams and map the tributary area for all outfalls with a diameter of 24 inches or greater.

- Continue discharge point inventory to include all locations where pipes and ditches discharge to BMPs or facilities designed to infiltrate and map the tributary area for all outfalls and discharge points with a diameter of 24 inches or greater as well as all geographic areas that do not discharge stormwater to surface waters.
- Establish an ongoing IDDE training program for appropriate City staff and a tracking form to document staff training.
- Adopt the IC/ID Field Screening and Source Tracing Guidance Manual and a documented tracking system for field activities.

Recommended Program Improvements

- Request that Pierce County update their catch basin inspection form to allow tracking of non-oil discharges.
- Improve publicity associated with reporting spills; display the spill hotline number prominently on the City's website and advertise it in City news outlets.
- Provide additional IDDE educational resources and references on the City's website. (Appendix A lists some example informative links.)
- Purchase basic equipment to assist with field screening including, mirror and pole, dye testing supplies, sand bags, smoke testing equipment, ammonia test strips, pH probe (with temperature probe), surfactant test kit, and potassium meter.

4.1.4. Controlling Runoff from New Development, Redevelopment, and Construction Sites

This permit component addresses runoff from new development, redevelopment, and construction site projects. It lays out requirements for a permitting and review, development of a plan for long terms operations and maintenance and inspection of stormwater facilities, and requires staff training. It also requires incorporation of LID principles and BMPs in development-related codes, rules, and regulations. The City currently requires Stormwater Maintenance Agreements for new development that spell out these inspection, maintenance, and reporting requirements.

One of the requirements of this component of the Permit is for the City to conduct annual inspections of privately-owned stormwater facilities. This requires first creating an inventory of those facilities, ensuring access agreements are in place with landowners, and implementation of the inspection and tracking program. This is the most critical gap for this component of the program.

In conjunction with pothole flood reduction plans described in Section 3, the City should evaluate how requirements for new development and redevelopment can be modified to support flood reduction in the potholes. Options include imposing regulations that restrict increases in impervious surface in areas tributary to the potholes, developing more stringent requirements for flow control in closed depression basins, and developing a funding strategy (e.g., fee-in-lieu system) that would enable redevelopment projects to fund regional flow control facilities, such as large infiltration facilities.

Recommendations

Required by Current Regulations

- Develop an inventory of privately owned facilities and implement a plan for inspections as well as procedures for record keeping and enforcement tracking.
- Update the Surface Water Compliance Application forms to ensure consistency with the 2015 Pierce County Stormwater Management and Site Development Manual (PCM).

Recommended Program Improvements

- Consider posting the SWPPP short form on the City's website
- Consider developing additional checklists and/or BMP sizing guidance.
- Consider adding additional training opportunities for plan reviewers and site inspectors and track related training.
- Conduct a Stormwater BMP Feasibility Assessment and provide maps for use by plan reviewers, developers and engineers.
- Develop a protocol for addressing private property-driven flooding issues. The protocol should include outreach to adjacent property owners and education on responsibilities and follow up activities. Consider identifying the drainage problems on property tax assessments or use other mechanisms to alert potential property owners during property transactions.

4.1.5. Municipal Operations and Maintenance

The City's municipal operations and maintenance program reduces stormwater impacts with regular activities such as catch basin cleaning and facility inspections. The program also includes detailed stormwater control plans for some facilities, staff training, and record management. The City's ILA with Pierce County assigns Pierce County with responsibilities for routine inspections, catch basin cleaning, and street sweeping, although during emergencies, City staff perform inspections and some maintenance tasks.

The City has adopted and implemented the PCM, which identifies maintenance standards and inspection requirements for stormwater facilities and meets other minimum requirements of Ecology's Stormwater Management Manual for Western Washington (Ecology 2012).

Recommendations

Recommended Program Improvements

- Request that Pierce County provide an annual list of maintenance activities completed by Pierce County crews through the ILA
- Request training records for the Pierce County crews responsible for City O&M activities.
- Develop a template and populate a training tracking log from City and County records.
- Finalize SOPs related to maintenance and operations to document the City's specific practices, policies and procedures. (The City has adopted Pierce County SOPs with some modifications, but these need to be finalized.)



Roadside ditches that are part of the City's surface water conveyance infrastructure require regular maintenance.

4.1.6. Compliance with Total Maximum Daily Loads (TMDLs)

The Puyallup Watershed Water Quality Improvement Project (Ecology 2017) (aka Puyallup River TMDL Plan) lays out a plan for addressing fecal coliform (FC) bacteria issues in the Puyallup River. The City of Edgewood must comply with TMDL requirements to designate areas discharging via the City's stormwater system to Jovita Creek (a tributary to the Puyallup) as high priority areas for IDDE field screening. Because IDDE field screening is conducted by Pierce County through the ILA, the City needs to designate Jovita Creek Watershed as high priority for routine field screening and communicate that designation to the county.

Recommendations

Required by Current Regulations

- Designate Jovita Creek Watershed as high priority for routine field screening and communicate that designation to Pierce County.

4.1.7. Monitoring and Assessment

The City contributes to the regional stormwater monitoring program in compliance with the Permit requirements. Because the City has also recently conducted some local stormwater monitoring, the City should report these projects and any results to Ecology.

Recommendations

Required by Current Regulations

- The City recently conducted a Hydrologic Surface Water Analysis for the 108th Avenue East neighborhood, and is preparing for further monitoring and potential improvements. A project description and results summary should be provided to Ecology in the next annual report.

Addresses Anticipated Regulations

- A surface water and groundwater monitoring program for the Edgewood potholes has been recommended (Section 3); if implemented the results should be included in the following years annual report.

4.1.8. Reporting

The City submits annual reports to Ecology and has developed a summary of internal coordination mechanisms, public access to records, and 5-year record storage. There were no gaps identified for this permit section.

4.1.9. Preparation for the Next Permit

The draft 2019–2023 NPDES Phase II Permit contains at least three components that the City should be aware of and start preparing for during the time that this Plan will be in place: a subbasin inventory, a source control program, and watershed planning. It is expected that much of what might be required for the subbasin inventory has been developed as part of this plan. (Appendix D provides all of the basin inventory data that is provided in different parts of this plan in one complete table.)

Source Control Program for Existing Development

The 2019–2023 NPDES Phase II Permit is expected to require the development and implementation of a proactive, preventative, inspection-based source control program for existing development. The preliminary draft permit includes the following:

- Develop a source control inventory
- Develop an ordinance and enforcement policy

- Develop and implement and on-going training program
- Implement a business inspection program.

Recommendations

Addresses Anticipated Regulations

- Create the source control business inventory template and begin populating the inventory focusing on new businesses and adding existing businesses as opportunity allows.
- Review existing source control requirements in EMC 13.25 after the new Permit is issued and revise if necessary to meet Permit requirements.
- Begin to develop inspection, enforcement, and training programs for this new Permit requirement.
- Implement a business inspection program by the deadline in the future Permit.

Long-Term Watershed Planning

Although the specifics are still being crafted, the Permit will include a need to conduct long term planning to protect receiving waters. The steps are likely to include:

- Creating an inventory of basins
- Prioritizing the basins using existing characterization information
- Identifying priority catchments within basins for planning
- Identifying approaches to protecting and restoring the catchment.

The basins as defined in this plan should be considered to represent the inventory of basins and much of the characterization data provided in this plan should suffice for an initial characterization. Since the City has already prioritized basins for planning as reflected in the CIP list, the key steps described in the draft guidance should be considered as already met.

Recommendations

- None at this time.

4.2. UNDERGROUND INJECTION CONTROL (UICs)

Underground Injection Controls (UIC wells) are part of the storm drainage system in the city that is not regulated through the Permit. Instead, UIC wells are regulated by Ecology as described in Ecology Publication 05-10-067 titled *Guidance Manual for UIC Wells that Manage Stormwater* (Ecology 2006). UIC wells must either be rule-authorized or covered by a state waste discharge permit to operate. To be rule-authorized, a registration form must be submitted with the Department of Ecology and wells must meet the non-endangerment standard, which means that they cannot endanger groundwater.

The City's storm drain system includes multiple UIC wells, including 54 drywells (see Table 2-8) and numerous infiltration pipes, and none of the UIC wells appear to be registered with Ecology. The City is required to register its UIC wells with Ecology and to accomplish this, needs to inventory the UIC wells and determine the type of facility and the year of construction. UIC wells constructed before February 3, 2006, are considered "existing" UIC wells, and a well assessment must be completed to determine if any of the existing wells are a high threat to groundwater. Wells constructed after February 3, 2006, are considered "new" UIC wells, and do not require a well assessment. The existing UIC wells that are a high threat to groundwater must be retrofitted to protect groundwater quality.



Groundwater is the main source of drinking water for City and area residents, so it is important to keep it free of stormwater contaminants.

The City should conduct the UIC well assessment using GIS analysis to evaluate land use around the wells (indicates potential for pollution), soil type, depth to groundwater (indicates likelihood of soil treatment potential), and location relative to groundwater protection areas.

Recommendations

Required by Current Regulations

- Conduct a complete inventory of all publicly-owned and operated UIC wells and register them with Ecology.
- Using the UIC guidance, determine which existing UIC wells pose a high threat to groundwater and then complete a well assessment to identify those high threat wells.
- Retrofit public wells that are a high threat to groundwater (no timeline for this is set by Ecology).
- Design and construct all new UIC wells according to the specifications in the UIC guidance (ongoing).

Recommended Program Improvements

- Construct opportunistic retrofits of all public UIC wells that pose a threat to groundwater by installing upstream water quality treatment facilities or other site-specific retrofits.
- Develop a targeted outreach program for private UIC well owners in areas found to pose a high threat to groundwater.

4.3. ASSET MANAGEMENT

Edgewood is served by a traditional conveyance network of catch basins, buried conveyance pipes, and open ditches. Much of this infrastructure is more than 80 years old, and therefore repair and replacement of the infrastructure is an important long-term need. Development of an asset management system will help address this need and enable the City to execute proactive repair, rehabilitation, and replacement strategies, rather than more costly, reactive emergency response to system failures. Asset management can be used to identify parts of the conveyance system that are prone to failure or that align with proposed projects in other departments, enabling the City to make more efficient and effective use of limited resources by combining projects from multiple departments.

The City should include a budget line item to cover regular repair and replacements separately from other CIP projects to avoid delaying CIP implementation when critical system repair needs arise. In the longer term, the City should consider long term asset management when purchasing infrastructure management software or equipment, such as CCTV inspection equipment, that could be shared between departments.

The following list lays out the recommendations related to establishing an asset management program. Although these are important they are not included as priority items in the Implementation Plan (Section 5) because the City has other important needs to focus on during the next 5 to 6 years.

Recommendations for Future Program

- Establish a program for collecting CCTV data on the buried conveyance network to evaluate condition and establish repair priorities.
- Select or develop an asset management platform to integrate software and database forms for evaluating and tracking repair and maintenance activities.
- Develop an asset management program to justify the systematic rehabilitation and replacement of infrastructure based on conditions assessment and criticality analysis
- Include a permanent fund for a repair and replacement of existing stormwater infrastructure in the annual budget.

4.4. PREPARING FOR CLIMATE CHANGE

As described previously, potential hydrologic changes associated with climate change increase the importance of stormwater management practices that control flows, promote infiltration, and preserve and enhance water quality. The potential for increased winter precipitation is likely to exacerbate conveyance and pothole flooding problems that Edgewood is already facing. Further, enhancing groundwater recharge and protecting water quality will become increasingly important as population grows, groundwater demands increase, and water resources become scarcer.

Recommendations

The following activities, some of which were identified in previous sections of this Plan, will help to prepare for and to mitigate climate change impacts:

- Implement pothole flood reduction studies and projects.
- Continue to promote dispersed infiltration (LID techniques) to control 100 percent of stormwater runoff on all sites, where it is feasible.
- Model the stormwater system to determine what areas are at, or near, flow capacity and thus prone to increased flood risk.
- Modify conveyance sizing requirements for new and redevelopment to account for larger peak flow events.
- Retrofit existing stormwater facilities to improve (or add) treatment performance and construct new facilities more conservatively.

5. PLAN IMPLEMENTATION

The following subsections describe stormwater program improvements and projects that are needed to fully achieve the City's surface water management goals and policies. The first three subsections define the stormwater program activities that need to be implemented and the staffing and equipment that are required to implement the activities. The final subsection defines capital improvement project (CIP) needs and a proposed timeline for project implementation.

5.1. STORMWATER PROGRAM ACTIVITIES

Tables 5-1, 5-2, and 5-3 list high priority, lower priority, and future anticipated stormwater program activities, respectively, for the City of Edgewood. High priority activities (Table 5-1) should be completed within 1 year of CSWMP adoption. In most cases they are considered a high priority because they are required by the existing Permit or other regulation. It is assumed that most of the high priority needs would be carried out (or continue to be carried out) by existing staff; in these cases, "0" hours have been allotted for additional staff time. Some tasks, particularly one-time activities or those that require specialized expertise, may more efficiently be performed by an external source such as a consultant; cost estimates have been provided for these activities. In some cases, there are start-up activities associated with a program need, these are identified as one-time costs whether they are slated for completion by staff or external sources. Additional information related to the assumptions for each activity can be found in Appendix A. It is important to understand that an important assumption around staffing is that the Stormwater Program Manager is dedicated to stormwater program activities half of the time. In a small city this can be difficult to achieve; thus, staffing needs are based on optimistic assumptions.

To fully implement these high priority needs would require approximately 0.25 FTEs on a full time permanent basis and another 0.30 FTEs on a temporary basis. External costs are estimated at \$71,000. The majority of this (\$50,000) is associated with the effort to retrofit existing UICs in high-threat areas. It has been estimated that it would cost approximately \$50,000 per well; this reflects an annual somewhat long-term cost for completing one well each year. The high-threat UIC well assessment will need to be completed before determining the duration of this annual need. One additional consideration for planning the UIC well retrofits is that completing the retrofits in batches (i.e., more than one well retrofit per project) could increase efficiency and reduce the cost per well.

Lower priority needs are addressed in Table 5-2. These activities are important to the overall functioning of the City's stormwater program and to make progress towards achieving the stormwater utility goals in Section 1.3, but they can be implemented more gradually. These

equate to an additional staffing need of approximately 0.20 FTE as well as external costs of \$50,000 one-time and \$10,000 annually. External costs are primarily associated with creating tools that would aid developers in complying with stormwater regulations and improve efficiency of the development review process. The financial analysis being prepared in support of this Plan will not include the staffing or financial resources required to implement these activities because the anticipated rate impact would not be acceptable at this time; however, this cost information should be considered during future financial analysis.

Anticipated future program needs are addressed in Table 5-3. Each of the activities has been defined based on draft language for the next Permit. Although the City is not currently required to implement these activities immediately, some are relatively easy tasks to perform; and they all make progress towards achieving the stormwater utility goals and positioning the utility for compliance with the next permit cycle which will begin in 2019 (before the next CSWMP update). Full implementation of these tasks would require some new staffing resources and \$8,000 in one-time funding; these costs have not been included in the financial analysis for this Plan.

Table 5-1. High Priority Program Activities and Costs.					
Program Area	Activity^a	One-time Additional Staffing Need (hours)^b	Annual Additional Staffing Need (hours)^b	One-time External Cost	Annual External Cost
Public Education and Outreach	Measure the understanding and adoption of targeted behaviors	0	80	\$10,000	\$0
	Develop a plan and schedule for creating or engaging in stewardship opportunities	0	80	\$0	\$0
Illicit Discharge Detection and Elimination	Update outfall and discharge point inventory and map the tributary areas associated with each.	0	0	\$0	\$20,000 ^c
	Establish an ongoing IDDE training program for appropriate City staff and a tracking form to document staff training.	0	0	\$0	\$0
	Adopt the IC/ID Field Screening and Source Tracing Guidance Manual and a documented tracking system for field activities.	0	0	\$0	\$0
	Purchase basic equipment to assist with field screening.	0	0	\$5,000	\$1,000

Table 5-1 (continued). High Priority Program Activities and Costs.					
Program Area	Activity^a	One-time Additional Staffing Need (hours)^b	Annual Additional Staffing Need (hours)^b	One-time External Cost	Annual External Cost
Controlling Runoff from New Development, Redevelopment, and Construction Sites	Develop an inventory of privately owned facilities and implement a plan for inspections as well as procedures for record keeping and enforcement tracking.	320	160	\$0	\$0
	Update the Surface Water Compliance Application forms to ensure consistency with the 2015 Pierce County Stormwater Management and Site Development Manual (PCM).	0	0	\$0	\$0
Municipal Operations and Maintenance (O&M)	Request an annual list of maintenance activities completed by Pierce County crews through the ILA.	0	0	\$0	\$0
	Request training records for the Pierce County crews responsible for City O&M activities.	0	0	\$0	\$0
	Develop a template and populate a training tracking log from City and County records.	0	0	\$0	\$0
	Finalize SOPs related to maintenance and operations to document the City's specific practices, policies and procedures.	0	80	\$0	\$0
Compliance with Total Maximum Daily Loads (TMDLs)	Prioritize Jovita Creek Watershed for routine field screening and track activities in this watershed.	0	0	\$0	\$0
Monitoring and Assessment	Provide summary of Hydrologic Surface Water Analysis for the 108th Avenue East neighborhood to Ecology in the next annual report.	0	0	\$0	\$0
Underground Injection Control (UICs)	Conduct an inventory of all publicly-owned and operated UIC wells and register them with Ecology.	40	0	\$0	\$0
	Determine which UIC wells pose a high threat to groundwater and complete a well assessment for them.	160	0	\$0	\$0

Table 5-1 (continued). High Priority Program Activities and Costs.					
Program Area	Activity^a	One-time Additional Staffing Need (hours)^b	Annual Additional Staffing Need (hours)^b	One-time External Cost	Annual External Cost
	Retrofit wells that are a high threat to groundwater. (No timeline for this is set by Ecology.)	0	0	\$0	\$50,000
	Design and construct all new UIC wells according to the specifications in the UIC guidance (ongoing).	0	0	\$0	\$0
TOTAL		520 hours 0.29 FTE^d	400 hours 0.23 FTE^d	\$15,000	\$71,000

^a Appendix A includes additional assumptions related to these activities.

^b Zero (0) hours indicates the task would be performed by existing staff.

^c This cost has been refined since development of the Gap Analysis and Needs Assessment was completed.

^d FTE calculation is based on an average of 1,768 working hours per year.

Table 5-2. Lower Priority Programs Activities and Costs.					
Program Area	Activity^a	One-time Additional Staffing Need (hours)^b	Annual Additional Staffing Need (hours)^b	One-time External Cost	Annual External Cost
Public Education and Outreach	Continue hosting community workshops for stormwater issues.	0	120	\$0	\$0
	Identify regional partners and educational programs and include links to these on the City website (Examples are provided in Appendix A).	0	20	\$0	\$0
	Implement the following activities as identified in the 2017 SWMP: Work with Puyallup School District to support stormwater education opportunities Work with the Pierce County Parks' Conservation Futures grant program to preserve sensitive areas.	0	100	\$0	\$0
	Finalize educational handouts for paving contractors.	0	40	\$0	\$0

Table 5-2 (continued). Lower Priority Programs Activities and Costs.

Program Area	Activity^a	One-time Additional Staffing Need (hours) ^b	Annual Additional Staffing Need (hours) ^b	One-time External Cost	Annual External Cost
Illicit Discharge Detection and Elimination	Request that Pierce County update their catch basin inspection form to allow tracking of non-oil discharges.	0	0	\$0	\$0
	Improve publicity associated with reporting spills; display the spill hotline number prominently on the City's website and advertise it in City news outlets.	0	0	\$0	\$0
	Provide additional IDDE educational resources and references on the City's website. (Appendix A lists some example informative links.)	0	0	\$0	\$0
Controlling Runoff from New Development, Redevelopment, and Construction Sites	Post the SWPPP short form on the City's website.	0	0	\$0	\$0
	Develop additional checklists and/or BMP sizing guidance in support of stormwater manual implementation.	0	0	\$25,000	\$0
	Create additional training opportunities for plan reviewers and site inspectors and track related training.	0	0	\$0	\$0
	Conduct GIS-based Stormwater BMP Feasibility Assessment and provide maps for use by plan reviewers, developers and engineers.	0	0	\$25,000	\$0
	Develop a protocol for addressing private property-driven flooding issues.	0	0	\$0	\$0
UICs	Develop a targeted outreach program for private UIC well owners in areas found to pose a high threat to groundwater.	0	40	\$0	\$10,000
TOTAL		0 hours	320 hours 0.18 FTE^c	\$50,000	\$10,000

^a Appendix A includes additional assumptions related to these activities.

^b Zero (0) hours indicates the task would be performed by existing staff.

^c FTE calculation is based on an average of 1,768 working hours per year.

Table 5-3. Anticipated Future Required Program Needs and Tasks.					
Program Area	Activity^a	One-time Additional Staffing Need (Hours) ^b	Annual Additional Staffing Need (Hours) ^b	One-time External Cost	Annual External Cost
Monitoring and Assessment	A surface water and groundwater monitoring program for the Edgewood potholes has been recommended (Section 3); if implemented the results should be included in the following years' annual report.	0	0	\$0	\$0
Source Control Program for Existing Development	Create the source control business inventory template and begin populating the inventory focusing on new businesses and adding existing businesses as opportunity allows.	40	0	\$0	\$0
	Review existing source control requirements in EMC 13.25 after the new Permit is issued and revise if necessary to meet Permit requirements.	0	0	\$0	\$0
	Begin to develop inspection, enforcement, and training programs for this new Permit requirement.	120	0	\$8,000	\$0
	Implement a business inspection program by the deadline in the future Permit.	0	120	\$0	\$0
Long Term Watershed Planning	Use the basins delineated in this Plan to represent the inventory and characterization requirements and the CIP list to reflect prioritization.	0	0	\$0	\$0
TOTAL		160 hours 0.09 FTE^c	120 hours 0.07 FTE^c	\$8,000	\$0

^a Appendix A includes additional assumptions related to these activities.

^b Zero (0) hours indicates the task would be performed by existing staff.

^c FTE calculation is based on an assumption of an average of 1,768 working hours per year.

There were also long-term needs and tasks that were identified that are not current or anticipated permit requirements or regulations but that should eventually be included as part of a comprehensive stormwater management program. These were identified under the subheadings of Asset Management and Preparing for Climate Change. No staffing or budget estimates have been prepared to address these and they are purposely not included as part of

this Implementation Plan because the City is not expected to have the resources to carry these out within the implementation period for this Plan.

5.2. STAFFING AND RESPONSIBILITIES

Table 5-4 lists staff that are currently funded by stormwater utility fees and identifies where additional staff are needed to fully support the stormwater program. Currently, the stormwater utility funds 2.9 FTEs; an additional 0.29 FTEs are needed on a permanent basis and 0.39 FTEs on a one-time basis. Responsibilities for implementing the stormwater management program are primarily carried out by Public Works department with support from the Planning and Land Use, Administration, and Building departments.

Table 5-4. Current (2017) and Recommended City of Edgewood SWMP Staff Support.			
Role/Department	Full Time Equivalent (FTE) Staff		
	Utility Funded Staff (FTE)	One-Time Additional Staffing Need (FTE)	Annual Additional Staffing Need (FTE)
Administration			
Assistant City Administrator	0.05		
City Clerk	0.02		
Communications Coordinator	0.05		
Accounting Manager	0.05		
Building			
Permit Coordinator	0.03		
Public Works			
Public Works Director	0.70		
Roads Superintendent	0.50		
Engineering Technician	0.50	0.39	0.29
Maintenance	0.40		
Planning and Land Use			
Community Development Director	0.30		
Administrative Support	0.30		
Total	2.90^a	0.39^b	0.29^b

^a Due to staffing changes during the course of this plan, there are differences between the staffing assignments shown in Appendix A and those on this table.

^b FTE calculation is based on 1,768 working hours per year.

5.3. EQUIPMENT RESOURCES

The major equipment currently used for the SWMP includes a skid steer and small dump truck, as well as basic equipment for emergency stormwater facility access: flashlight, catch basin hooks, and turbidimeter. While Pierce County is still primarily responsible for inspections and maintenance, some equipment is recommended to allow City staff to assist with field screening and source tracing activities. These represent a one-time cost of \$5,000 and a \$1,000 annual replacement cost. The following equipment is needed:

- Mirror and pole
- Dye testing supplies
- Sand bags
- Smoke testing equipment
- Ammonia test strips
- pH probe (with temperature probe)
- Surfactant test kit
- Potassium meter

5.4. CAPITAL IMPROVEMENT PROGRAM

The CIP list included in the draft edition of this plan was reviewed by the City Council and the public, and information obtained during that review process was used to refine the list and prioritize the projects. Table 5-5 reflects these decisions and provides the final prioritized list of the CIPs identified in Section 3 with a timeline for their implementation. While there are no low priority projects on the list, the City recognizes that not all of these projects can be funded without a significant increase in stormwater utility fees. Those projects listed as critical are those that are considered the highest priority for more immediate action.

For example, while all of the pothole flood reduction plans address existing flooding, the Edgewood Pothole Pilot Project Feasibility Assessment is the highest priority because the findings will be critical for identifying the suite of tools that may be available for use in developing the pothole flood reduction plans. Completion of the flood reduction plan for Edgewood Pothole is also critical due to the extent of flooding from this pothole. The Lake Chalet project is considered critical because this area is experiencing more development pressure and has more structures already in jeopardy during flood events. The three listed localized flooding projects associated with roadways are considered critical either because they have been on the City's CIP list for a long time or because they represent significant neighborhood-wide problems that are difficult to resolve under the Spot Improvement Program.

Table 5-5. Capital Improvement Project (CIP) List for Edgewood's Stormwater Plan.

Priority	Project No.	Project Name	Grant Contingent	Critical	Total	2018	2019	2020	2021	2022	2023	Future Years
1	SW-6	Surface Water Management Plan Update (including stormwater comprehensive plan update)	No	Critical	200,000	75,000	25,000	25,000	25,000	25,000	25,000	25,000 EA
2	SW-1	City Drainage Infrastructure Program/Spot Improvements	No	Critical	600,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000 EA
3	New	Edgewood Pothole Pilot Project Feasibility Assessment ^a	No	Critical	460,000	70,000	310,000	80,000	–	–	–	
4	New	Lake Chalet Pothole Flood Reduction Project (Pump Station to gravity flow option)	No	Critical	500,000	–	500,000	–	–	–	–	
5	New	24th/112th Seasonal Ponding	No	Critical	175,000	15,000	160,000					
6	New	108th Ave E./8th to 16th Flooding	No	Critical	350,000		40,000	250,000	60,000			
7	SW-5	108th Ave E./36th St. E. Road Flooding	No	Critical	1,000,000	–	–	50,000	800,000	150,000	–	
8	New	Flood Reduction Plan for Edgewood Pothole	No	Critical	170,000	–	–	170,000	–	–	–	
9	New	Infiltration Pilot Project Design and Construction	No	No	1,900,000	–	–	100,000	750,000	1,050,000	–	
10	New	Flood Reduction Plan for Pinedale Pothole	No	No	170,000	–	–	–	–	170,000	–	
11	New	Flood Reduction Plan for 122nd Avenue Pothole	No	No	170,000	–	–	–	85,000	85,000	–	
12	New	Flood Reduction Plan for 108th Avenue Pothole	No	No	170,000	–	–	–	–	170,000	–	
13	New	Flood Reduction Plan for Surprise Lake Pothole	No	No	170,000	–	–	–	–	–	170,000	
14	SW-11	Jovita Boulevard Rehabilitation	No	No	500,000	–	–	–	50,000	300,000	150,000	
15	New	Edgewood Drive East Drainage Improvements	No	No	860,000	–	–	–	–	–	860,000	
16	New	Meridian Ave Corridor Study	No	No	50,000			50,000				
17	SW-3	Jovita Creek Regional Improvement Feasibility Study	Yes	No	500,000	–	–	–	175,000	175,000	150,000	
18	SW-2	Mortenson Farm Regional Stormwater Improvements	Yes	No	1,250,000	–	50,000	700,000	500,000	–	–	
19	SW-7	25th St. E. Drainage Improvements ^b	No	No	200,000	–	–	–	–	–	200,000	
Total Expenditures through 2023 (2017 Dollars)					9,395,000	260,000	1,185,000	1,525,000	2,545,000	2,225,000	1,655,000	125,000
Expenditures-Critical Projects Only (2017 Dollars)					3,455,000	260,000	1,135,000	675,000	985,000	275,000	125,000	125,000

^a Includes cost of Pothole Water Level and Water Quality Monitoring.

^b This roadway segment is now closed to traffic, and the City is re-evaluating the design solution for this site.

There are also two large projects that would be unlikely to move forward without substantive support from other agencies and/or grants. The Jovita Creek basin (and therefore the area affected by the Jovita Creek Regional Improvement Feasibility Study) lies primarily within unincorporated King County. While this stream is important to the City and they would be a major stakeholder in any study, they would not likely provide the main funding unless it was through a grant. Similarly, the Mortenson Farm Regional Stormwater Improvement Project is still conceptual and is most likely to be driven by mitigation needs related to the SR 167 highway corridor improvements, rather than representing a high priority need for the City.

Implementation of just the critical projects represents a significant investment of an average of approximately \$0.6 million per year over the next 6 years. The City has successfully obtained grant funding for the Feasibility Assessment for the Edgewood Pothole Pilot Study and will continue to look for financial assistance through grant and loan programs for appropriate projects, but ultimately implementation of just the critical needs is well beyond the current budget of the stormwater utility.

There are unique features about the City's demographics and geography that together create special challenges for stormwater management. First, Edgewood has a comparatively low population density. Figure 5-1 shows population densities for some nearby small cities in Puget Sound. All of the cities have a higher population density than Edgewood; three have more than 2.5 times more people per square mile. Since most of the costs associated with operating a stormwater program are the same no matter the size or population of the city, fewer people in Edgewood simply equates to a higher cost per person. Another related factor is that there are comparatively few commercial businesses. Typically, commercial businesses pay a larger share of stormwater fees because they contribute more to stormwater problems. Figure 5-2 provides a comparison of the amount of revenue generated to stormwater utilities from non-residential properties (primarily commercial properties) in some nearby small cities. As shown, non-residential customers account for only 36 percent of Edgewood's revenue whereas in other local cities they account for 52 percent to 72 percent. These two factors of low population and fewer commercial accounts together play a significant role in affecting cost per parcel.

Edgewood's unique geology also causes problems and related costs that other communities do not experience. Thus, in addition to typical storm drainage problems such as the Edgewood Drive improvements included in Table 5-5, there are a series of needs that other cities do not have. The city's location on the plateau and its geology have resulted in formation of the six potholes with difficult to solve flooding problems. Studies and plans for addressing these problems (including the Lake Chalet pothole project) account for over \$3.7 million of the CIP project costs (Table 5-5). In addition, the steep ravines that drain water from the plateau to the valley floor cause extensive erosion, drainage, and roadway problems, which also contribute to capital project costs. A financial analysis and rate study to evaluate stormwater utility finances was completed as part of this planning process and is included as Appendix E.

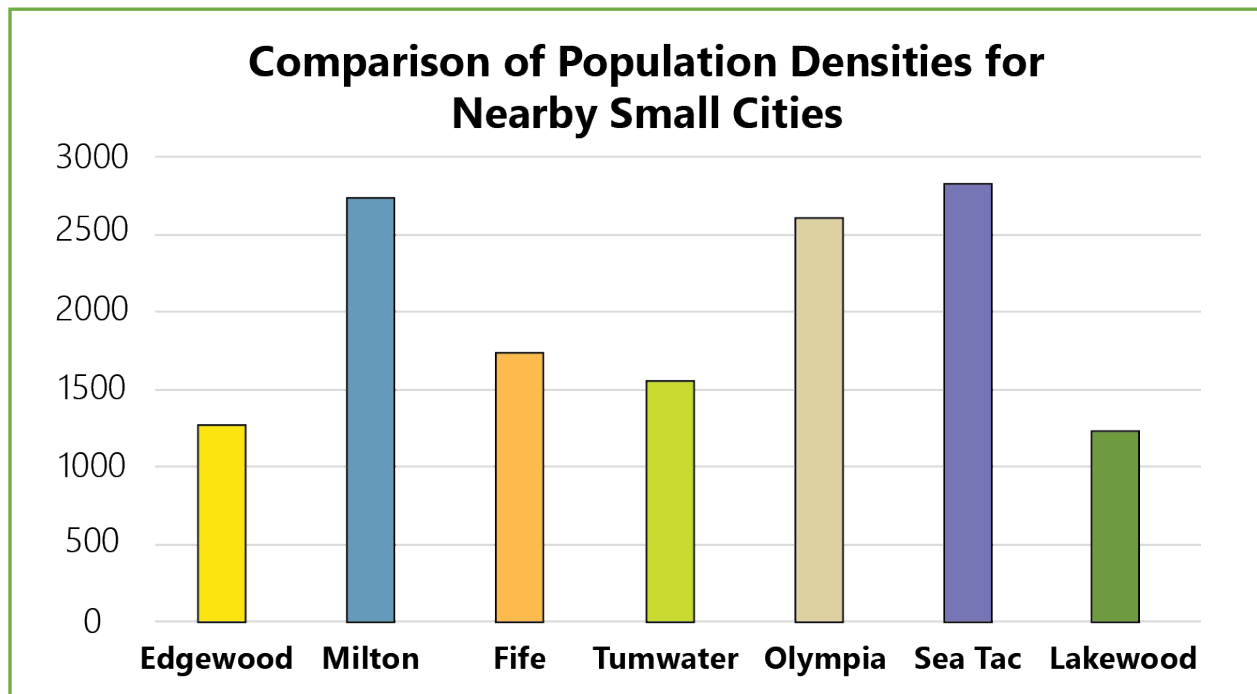


Figure 5-1. Comparison of Population Densities for Nearby Small Cities.

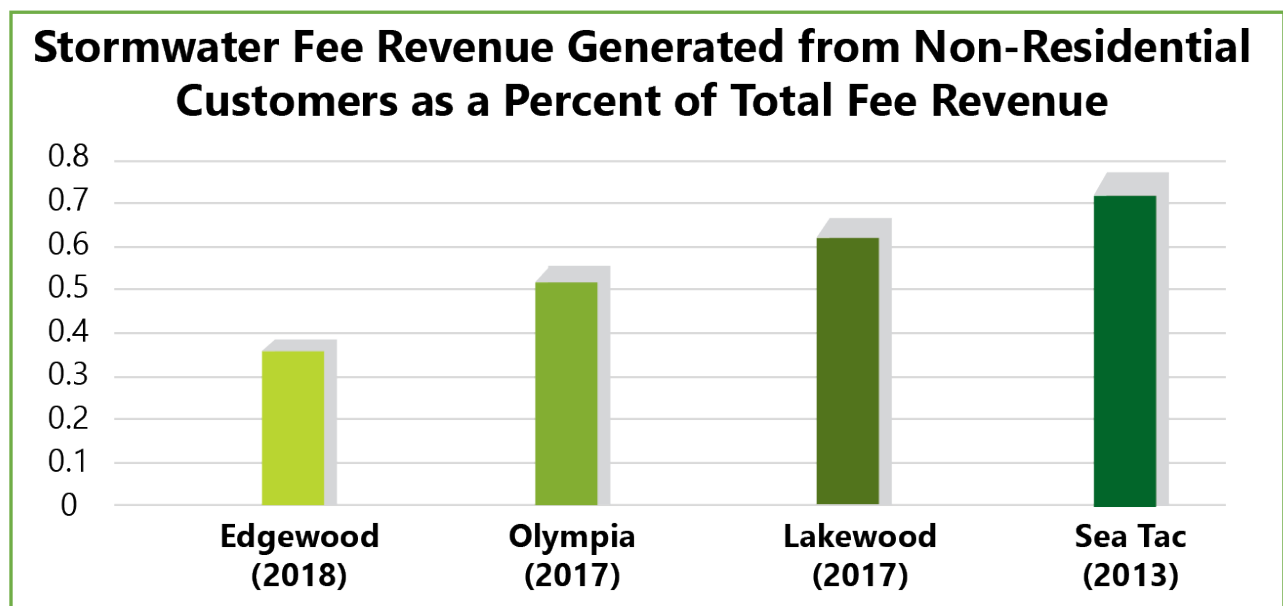


Figure 5-2. Stormwater Fee Revenue Generated from Non-Residential Customers as a Percent of Total Fee Revenue.

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APPENDIX A

Technical Memorandum: City of Edgewood Stormwater Program Gap Analysis and Needs Assessment

Date: August 24, 2017
To: Jeremy Metzler, PE, City of Edgewood
From: Rebecca Dugopolski, PE; Meghan Mullen; and Joy Michaud, Herrera Environmental Consultants
Subject: City of Edgewood Stormwater Program Gap Analysis and Needs Assessment

BACKGROUND

The City of Edgewood (City) currently implements its Stormwater Management Program (SWMP) to achieve regulatory compliance and to minimize the adverse impacts of stormwater on the natural and built environments (i.e., managing peak flow volumes to avoid flooding and providing water quality treatment to mitigate impacts on receiving waters). Implementation of the SWMP is primarily the responsibility of the Public Works Department, with support provided by the Operations and Maintenance division of Public Works, Community Development Department, and Parks and Recreation Department.

The current SWMP activities are described in the 2017 SWMP and 2016 annual report that was submitted to the Washington State Department of Ecology (Ecology) in March 2017. The SWMP includes information on planned SWMP activities to meet the requirements of Ecology's National Pollutant Discharge Elimination System Western Washington Phase II Municipal Stormwater Permit (NPDES Phase II Permit), which is the most significant regulatory requirement driving the City's stormwater program. The NPDES Phase II Permit, requires that the City prepare annual reports to document activities taken to meet the associated requirements.

In preparation of this report, the City's SWMP activities and documentation were reviewed to identify gaps in the SWMP. The primary focus of this effort was to evaluate the program against requirements of the NPDES Phase II Permit; however, other program needs have also been included if they were identified by City staff. Appendix A contains a detailed matrix of the City's activities, provides recommendations for meeting identified data gaps, and includes funding and staffing estimates associated with the recommendations. The purpose of this memorandum is to provide an overview of the gap analysis process and briefly summarize the recommendations from Appendix A. The recommendations will be used by City staff to direct further SWMP activities and to help guide the City's Stormwater Management Plan update.

METHODS OF ANALYSIS

Potential gaps and areas for improvement were identified through a review of available documents, a questionnaire sent to City staff, a project kickoff meeting with City staff, and follow-up discussions.

Document Review

Document review included pertinent documents identified and/or provided by the City, including City codes and policies, maps and GIS data, SWMP documents, public education materials, and operations and maintenance (O&M) information. These were reviewed to provide a foundation for characterizing the existing SWMP.

Questionnaire and Kickoff Meeting

To examine the components of the City's SWMP in more detail and to identify gaps and potential issues, City staff members representing various aspects of the City's stormwater program attended a project kickoff meeting with Herrera staff on May 12, 2017.

A Gap Analysis questionnaire was distributed to participants in advance of the meeting to gather staff input and perspective on key stormwater issues. Questionnaire responses were used to shape and facilitate the meeting discussion, focusing on NPDES Phase II Permit requirements, staffing needs, and other issues of concern to City staff.

NPDES PHASE II PERMIT REQUIREMENTS

The most significant regulatory requirement facing the City's SWMP is Ecology's NPDES Phase II Permit, which addresses a variety of issues associated with stormwater runoff and requires the City to develop several distinct SWMP components. The current NPDES Phase II Permit (issued by Ecology on August 1, 2012; effective on August 1, 2013) specifies requirements for the following:

- Public education and outreach
- Public involvement and participation
- Illicit discharge detection and elimination (IDDE)
- Controlling runoff from new development, redevelopment, and construction sites
- Municipal operations and maintenance (O&M)
- Compliance with Total Maximum Daily Load (TMDL) Requirements

- Monitoring and Assessment
- Reporting Requirements

Recommendations associated with each of these components are provided in Appendix A along with additional resources (e.g., staffing and equipment) required to implement these recommendations.

CONCLUSIONS

The City's SWMP meets a majority of the NPDES Phase II Permit requirements; however, there are two primary areas where additional resources are needed: Public Education and Outreach and Controlling Runoff from New Development, Redevelopment, and Construction Sites. Two additional areas (IDDE and Municipal O&M) could also use a slight increase in funding or staff support to meet existing NPDES Phase II Permit requirements. Based on the recommendations provided in Appendix A, one-time funding needs have been estimated at \$50,000; and ongoing funding needs have been estimated at \$1,000. One-time funding needs have been identified to support requirements of the City's IDDE program and to support Controlling Runoff from New Development, Redevelopment, and Construction Sites. Ongoing funding would support the replacement of equipment used for illicit discharge field screening and source tracing as part of the City's IDDE program.

Additional City staff support needed has been estimated at 840 hours (or 0.48 Full Time Equivalents [FTE]). This additional staff support is needed to support requirements of the City's Public Education and Outreach program, to Controlling Runoff from New Development, Redevelopment, and Construction Sites, and to support Municipal O&M.

Table 1. Summary of Funding and Staffing Recommendations.				
Permit Section	Funding		Staff Support	
	One-time	Ongoing	Hours	FTE
Public Education and Outreach	\$10,000	\$0	440	0.25
Public Involvement and Participation	\$0	\$0	0	0
IDDE	\$15,000	\$1,000	0	0
Controlling Runoff from New Development, Redevelopment, and Construction Sites	\$25,000	\$0	320	0.18
Municipal O&M	\$0	\$0	80	0.05
Compliance with TMDL Requirements	\$0	\$0	0	0
Monitoring and Assessment	\$0	\$0	0	0
Reporting	\$0	\$0	0	0
Total	\$50,000	\$1,000	840	0.48

APPENDIX A

City of Edgewood Stormwater Management Program Activities and Recommendations

Table A-1. City of Edgewood Stormwater Management Program Activities and Recommendations.				
Permit Section	Current Activities	Recommendations	Additional Support Needed (staff/funding)	Support Assumptions
Public Education and Outreach				
S5.C.1.a – Education and outreach program “To build general awareness, Permittees shall select from the following target audiences and subject areas: (a) General public (including school age children), and businesses (including home-based and mobile businesses): - General impacts of stormwater on surface waters. - Impacts from impervious surfaces. - Impacts of illicit discharges and how to report them. - Low impact development (LID) principles and LID BMPs. - Opportunities to become involved in stewardship activities.”	Based on the City’s website: - Brochures and resources on the City website under the heading “What can you do to help protect the environment?” www.cityofedgewood.org/government/public_works/surface_water_management.php “Ten Ways You Can Improve the Quality of Stormwater Runoff” Handout: “Fish-Friendly Car Wash” handouts: - Handout that describes the negative impacts of traditional car wash practices - Handout with contact information and a description of the car wash kit that can be used for fundraising car washes - Handout with instructions on how to set up the car wash kit - Natural Yard Care handouts: “Soil and Mulch” Handout: describes soil components, how to amend soils, and how to mulch (Step 1 of the Natural Yard Care program). “Planning and Planting a Sustainable Landscape” Handout: describes how to plan landscaping and select appropriate plants (Step 2 of the Natural Yard Care program). “Watering Wisely” Handout: describes timing, amounts, and techniques for watering and irrigation (Step 3 of the Natural Yard Care program). “Think Twice Before Using Pesticides” Handout: describes alternative approaches to pesticide use for pest management (Step 4 of the Natural Yard Care program). “Natural Lawn Care” Handout: describes maintenance practices including mowing, fertilizing, watering, de-thatching and aerating, and controlling pests and weeds (Step 5 of the Natural Yard Care program). - Link to the Ecology website page for Washington Waters and related programs. - Link to the Ecology website for Saving Puget Sound and related programs. Based on the 2017 Stormwater Management Program (SWMP): - Publish articles in City’s quarterly Edgewood Magazine that are related to stormwater. - Provide copies of the <i>Rain Garden Handbook for Western Washington</i> at City Hall. - City has hosted community workshops addressing LID BMPs, conservation, etc., in the past.	- Move forward with planned activities in the 2017 SWMP: - Work with Puyallup School District on stormwater education opportunities - Work with the Pierce County Parks’ Conservation Futures grant program to preserve sensitive areas - Finalize educational handout for paving contractors. - Update broken website links: - The “water-saving tips” page - Recycling and Disposal of Household Hazardous Waste page from Pierce County - Identify regional partners and regional public education campaigns that the City could participate in or post resources from: - Puget Sound Starts Here www.pugetsoundstartshere.org/ - Don’t Drip and Drive https://fixcarleaks.org/ - Natural Yard Care: www.co.pierce.wa.us/1816/Natural-Yard-Care - Source control resources (see IDDE recommendations under S5.C.3)	160 hours (0.09 FTE)	Assumes 160 hours needed to update the website, coordinate with other partners and programs, and to develop and update some basic educational handouts (ongoing).
		Host additional community workshops.	120 hours (0.07 FTE)	Assumes 120 hours needed to update the workshop materials, schedule, advertise, and implement at least one workshop annually (ongoing).
(b) Engineers, contractors, developers and land use planners: - Technical standards for stormwater site and erosion control plans. - LID principles and LID BMPs. - Stormwater treatment and flow control BMPs/facilities.”	Refer to handouts listed under New Development, Redevelopment, and Construction Sites (see S5.C.4).	Refer to S5.C.4.	NA	NA

Table A-1 (continued). City of Edgewood Stormwater Management Program Activities and Recommendations.				
Permit Section	Current Activities	Recommendations	Additional Support Needed (staff/funding)	Support Assumptions
Public Education and Outreach (continued)				
S5.C.1.b – Stewardship opportunities “Each Permittee shall create stewardship opportunities and/or partner with existing organizations to encourage residents to participate in activities such as stream teams, storm drain marking, volunteer monitoring, riparian plantings and education activities.”	No specific stewardship opportunities have been identified.	- Develop a plan and a schedule for complying with this permit requirement. - Move forward with planned activities in the 2017 SWMP: - Coordinate with Pierce Conservation District Stream Teams for the Puyallup River watershed. - Consider implementing a tree planting community event. - Consider distributing free trees or rain barrels at a community event. - Consider a tree coupon program similar to the City of Tacoma: www.cityoftacoma.org/cms/one.aspx?objectId=66710. - Consider implementing a catch basin marking program with local scouts or other community groups.	80 hours (0.05 FTE)	Assumes 80 hours of outreach needed per year (ongoing).
S5.C.1.c – Measure the understanding and adoption of targeted behaviors “Each Permittee shall measure the understanding and adoption of the targeted behaviors for at least one target audience in at least one subject area. No later than February 2, 2016, Permittees shall use the resulting measurements to direct education and outreach resources most effectively, as well as to evaluate changes in adoption of the targeted behaviors. Permittees may meet this requirement individually or as a member of a regional group.”	Based on the 2016 Annual Report: - City has identified target audience: engineers, contractors, and developers. - City has identified subject areas: - Technical standards for stormwater site development - LID techniques - Developed “Storm drainage minimum design requirements for small projects” handout.	- Submit a G20 Non-Compliance Notification letter to Ecology with a plan and schedule for complying with the evaluation component of this permit requirement. - Develop and conduct a survey for the target audience to follow up on effectiveness of this form. - Develop a short report or memorandum summarizing the results of the survey. - Update handout based on survey feedback.	80 hours (0.05 FTE) \$10,000 (one-time)	Assumes 80 hours needed initially to write the G20 letter, develop the survey approach, and work with an external consultant/contractor to implement the survey. Ongoing costs would be to update the survey and to implement changes in the public education program. External support budget assumes 100 hours at a rate of \$100/hour.
Public Education and Outreach Subtotal			440 hours (0.25 FTE) and \$10,000 (one-time)	
Public Involvement and Participation				
S5.C.2.a – Create opportunities for public participation “Permittees shall provide ongoing opportunities for public involvement and participation through advisory councils, public hearings, watershed committees, participation in developing rate-structures or other similar activities. Each Permittee shall comply with applicable state and local public notice requirements when developing elements of the SWMP.” The minimum performance measures are: “Permittees shall create opportunities for the public to participate in the decision-making processes involving the development, implementation and update of the Permittee’s SWMP.”	Based on 2016 Annual Report: - The City provides public notice for review and update of all codes, comprehensive plans, and capital improvement programs. The first stop in the review process for any proposed change is the City’s Planning Commission, where there are both formal and informal public review opportunities. - Recommendations of the Planning Commission are forwarded to the City Council for final review and action, which includes another public notice and hearing opportunity. - Larger programs and projects, such as comprehensive plan updates, typically include more involved public participation, such as workshops and town halls. Based on Questionnaire: - The Citizen Action Request (CAR) form is available at the counter and on the website. The system allows for complaints to be filed, investigated and resolved by members of City Staff.	No gaps identified.	NA	NA

Table A-1 (continued). City of Edgewood Stormwater Management Program Activities and Recommendations.																																		
Permit Section	Current Activities	Recommendations	Additional Support Needed (staff/funding)	Support Assumptions																														
Public Involvement and Participation (continued)																																		
S5.C.2.b – Post the SWMP Plan and annual report on City’s website “Each Permittee shall post on their website their SWMP Plan and the annual report required under S9.A no later than May 31 each year. All other submittals shall be available to the public upon request. ”	Current SWMP, annual report, and attachments are posted on the City’s website: www.cityofedgewood.org/government/public_works/surface_water_management.php .	No gaps identified.	NA	NA																														
Public Involvement and Participation Subtotal			NA																															
Illicit Discharge Detection and Elimination (IDDE)																																		
S5.C.3.a – Ongoing mapping requirements “Mapping of the MS4 shall continue on an ongoing basis. MS4 maps shall be periodically updated. Update maps if necessary to meet the requirements of this section no later than February 2, 2018. At a minimum, maps shall include the following information: i. Known MS4 outfalls and known MS4 discharge points. ii. Receiving waters, other than ground water. iii. Stormwater treatment and flow control BMPs/facilities owned or operated by the Permittee. iv. Tributary conveyances to all known outfalls and discharge points with a 24 inch nominal diameter or larger, or an equivalent cross-sectional area for non-pipe systems. The following attributes shall be mapped: - o Tributary conveyance type, material, and size where known. - o Associated drainage areas. - o Land use. v. All connections to the MS4 authorized or allowed by the Permittee after February 16, 2007. vi. Connections between the MS4 owned or operated by the Permittee and other municipalities or public entities. vii. Geographic areas served by the Permittee’s MS4 that do not discharge stormwater to surface waters.”	Based on the 2017 SWMP: - MS4 base map available through Pierce County’s CountyView GIS platform developed in 2009 and updated each year: www.co.pierce.wa.us/2281/GIS-Applications. - o Pierce County has mapped streams and wetlands as receiving waters. - o Pierce County has mapped stormwater treatment and flow control structures including catch basins, control structures, dry wells, manholes, and vaults. - o Pipes and channels mapped by Pierce County include material, type, size, and a description of discharge points. Possible outfalls based on this data are summarized in the table below: <table><tr><th>Conveyance Structure</th><th>Ponds</th><th>Streams</th><th>Potholes</th><th>Ravines</th><th>Wetlands</th></tr><tr><td>All Pipes</td><td>71</td><td>86</td><td>55</td><td>17</td><td>18</td></tr><tr><td>Pipes over 24-inch diameter</td><td>0</td><td>17</td><td>0</td><td>0</td><td>0</td></tr><tr><td>All Channels</td><td>18</td><td>9</td><td>34</td><td>8</td><td>19</td></tr><tr><td>Channels over 24 inches deep</td><td>1</td><td>0</td><td>1</td><td>1</td><td>6</td></tr></table> Based on the May 12, 2017, kickoff meeting: - The City has identified five known outfalls: - o At 114th north of Jovita (24-inch diameter) - o At the pond south of 24th on Meridian (Simon’s Creek) (12-inch diameter) - o Edgewood Drive (southeast corner into Sumner) (12-inch diameter, discharges into a ravine) - o At the corner of 32nd Street East and 94th Avenue East (Simon’s Creek) (12-inch diameter) - o At the crossing of the Surprise Lake discharge channel at 92nd Avenue East (south of 20th) (48-inch diameter) Based on the City’s website: - The City has mapped land use designations: www.cityofedgewood.org/government/planning_and_land_use/index.php	Conveyance Structure	Ponds	Streams	Potholes	Ravines	Wetlands	All Pipes	71	86	55	17	18	Pipes over 24-inch diameter	0	17	0	0	0	All Channels	18	9	34	8	19	Channels over 24 inches deep	1	0	1	1	6	- Update outfall inventory to include discharges to pothole/closed depression areas that should be classified as outfalls. - Map the tributary area for the known outfalls of 24-inch diameter or greater.	\$10,000 (one-time)	Assumes contract (or intern) support is needed (100 hours at \$100/hour).
Conveyance Structure	Ponds	Streams	Potholes	Ravines	Wetlands																													
All Pipes	71	86	55	17	18																													
Pipes over 24-inch diameter	0	17	0	0	0																													
All Channels	18	9	34	8	19																													
Channels over 24 inches deep	1	0	1	1	6																													

Table A-1 (continued). City of Edgewood Stormwater Management Program Activities and Recommendations.				
Permit Section	Current Activities	Recommendations	Additional Support Needed (staff/funding)	Support Assumptions
IDDE (continued)				
S5.C.3.b – Illicit discharge ordinance “Each Permittee shall implement an ordinance or other regulatory mechanism to effectively prohibit non-stormwater, illicit discharges into the Permittee’s MS4 to the maximum extent allowable under state and federal law.”	Based on 2016 Annual Report: EMC 13.25 – Illicit Stormwater Discharges updated by Ordinance 16-482 on November 8, 2016.	No gaps identified.	NA	NA
S5.C.3.c – Ongoing program implementation to identify and detect illicit discharges The program shall include the following components: i. Procedures for conducting investigations of the Permittee’s MS4, including field screening and methods for identifying potential sources.	Based on 5/12/17 kickoff meeting: - The City has an interlocal agreement (ILA) with Pierce County to perform catch basin inspections and cleaning. - There are boxes on the Pierce County inspection form to check for oil presence, condition, and comments. Based on 2016 Annual Report: 40 percent of MS4 coverage area screened in 2016.	- Provide recommendations to Pierce County staff on information that the City would like to track for compliance with this permit requirement. - Consider modifying “oil presence” field to apply to other illicit discharges or adding another field for non-oil discharges.	NA	Complete with current staffing.
ii. A publicly listed and publicized hotline or other telephone number for public reporting of spills and other illicit discharges.	Based on 2016 Annual Report: - City Hall contact information: 253-952-3299. 4 calls received in 2016.	- Spill hotline is the same as the City Hall general information line and is not well publicized. - Place hotline more prominently on the City’s website or create a hotline specific to reporting spills.	NA	Complete with current staffing.
iii. An ongoing training program for all municipal field staff, who, as part of their normal job responsibilities, might come into contact with or otherwise observe an illicit discharge and/or illicit connection to the MS4, on the identification of an illicit discharge and/or connection, and on the proper procedures for reporting and responding to the illicit discharge and/or connection. Follow-up training shall be provided as needed.	No established training program for IDDE.	- Require applicable City staff to watch Illicit Connection and Illicit Discharge (IC/ID) Field Screening and Source Tracing Guidance Manual videos: www.wastormwatercenter.org/illicit-connection-illicit-discharge. - Attend in-person IC/ID field screening training in late 2018.	NA	Complete with current staffing.
iv. Permittees shall inform public employees, businesses, and the general public of hazards associated with illicit discharges and improper disposal of waste.	- General information provided on website (see S5.C.3.a). - Property/business owners are educated upon discovery of potential hazards/illicit discharges.	Consider providing the following resources on the City’s website: - Dump Smart Program (carpet cleaners, painters, and pressure washers): www.wastormwatercenter.org/dump-smart - Ecology pollution prevention by business type website: www.ecy.wa.gov/programs/hwtr/p2/ta.html - Ecology hazardous substances website: www.ecy.wa.gov/hsieo/index.html - City of Seattle resources (restaurants): www.seattle.gov/util/ForBusinesses/GreenYourBusiness/ToolsResourcesGuides/index.htm - Clark County dumpster maintenance brochure: www.clark.wa.gov/sites/default/files/dept/files/environmental-services/Stormwater/what-you-can-do/Dumpster%20maintenance%20web%206_2_16.pdf	NA	Complete with current staffing or proposed Public Education and Outreach staff under S5.C.1 above.

Table A-1 (continued). City of Edgewood Stormwater Management Program Activities and Recommendations.				
Permit Section	Current Activities	Recommendations	Additional Support Needed (staff/funding)	Support Assumptions
IDDE (continued)				
S5.C.3.d – Ongoing program implementation to address illicit discharges “Each Permittee shall implement an ongoing program designed to address illicit discharges, including spills and illicit connections, into the Permittee’s MS4. The program shall include: i. Procedures for characterizing the nature of, and potential public or environmental threat posed by, any illicit discharges found by or reported to the Permittee. Procedures shall address the evaluation of whether the discharge must be immediately contained and steps to be taken for containment of the discharge. ii. Procedures for tracing the source of an illicit discharge; including visual inspections, and when necessary, opening manholes, using mobile cameras, collecting and analyzing water samples, and/or other detailed inspection procedures. iii. Procedures for eliminating the discharge; including notification of appropriate authorities; notification of the property owner; technical assistance; follow-up inspections; and use of the compliance strategy developed pursuant to S5.C.3.b.v, including escalating enforcement and legal actions if the discharge is not eliminated.	Based on May 12, 2017, kickoff meeting: • City staff investigate calls about IDDE issues. • Current equipment includes: flashlight, catch basin hooks, turbidimeter. • Pierce County can assist with IDDE response if requested as part of the ILA.	• Adopt and/or modify the IC/ID Field Screening and Source Tracing Guidance Manual. • Purchase basic equipment to assist with field screening and source tracing: - o Mirror and pole - o Dye testing supplies - o Sand bags - o Smoke testing equipment - o Ammonia test strips - o pH probe (with temperature probe) - o Surfactant test kit - o Potassium meter	\$5,000 (one-time) \$1,000 (annual replacement/restocking cost)	Adopting and/or modifying the IC/ID Field Screening and Source Tracing Guidance Manual will be completed with current staffing.
S5.C.3.e – Ongoing staff training program “Permittees shall train staff who are responsible for identification, investigation, termination, cleanup, and reporting of illicit discharges, including spills, and illicit connections, to conduct these activities. Follow-up training shall be provided as needed to address changes in procedures, techniques, requirements or staffing. Permittees shall document and maintain records of the training provided and the staff trained.”	No established training program for IDDE.	• Require applicable City staff to watch IC/ID Field Screening and Source Tracing Guidance Manual videos: www.wastormwatercenter.org/illicit-connection-illicit-discharge. • Attend in-person IC/ID field screening training in late 2018. • Develop a spreadsheet or simple tracking form to document staff training.	NA	Complete with current staffing.
S5.C.3.f – Track and maintain records “Recordkeeping: Permittees shall track and maintain records of the activities conducted to meet the requirements of this section.”	Based on Questionnaire responses: • The City tracks all complaints, including spills, with the Citizen Action Request (CAR) program which includes an online reporting option: http://cityofedgewood.org/government/city_clerk/citizen_action_form.php.	No gaps identified.	NA	NA
IDDE Subtotal			\$15,000 (one-time) and \$1,000 (ongoing)	

Table A-1 (continued). City of Edgewood Stormwater Management Program Activities and Recommendations.				
Permit Section	Current Activities	Recommendations	Additional Support Needed (staff/funding)	Support Assumptions
Controlling Runoff from New Development, Redevelopment, and Construction Sites				
S5.C.4.a – Ordinance to address runoff from development, redevelopment, and construction sites “Implement an ordinance or other enforceable mechanism that addresses runoff from new development, redevelopment, and construction site projects ...”	Based on 2017 SWMP: - Policy requires that stormwater facilities are owned and maintained by HOAs, property owners, or another private party. The developer is required to execute and record an <i>Agreement to Maintain Stormwater Facilities and Implement a Pollution Source Control Plan</i>: - O&M Plan and facility inspection requirements. - Requires annual inspection and reporting by responsible party which is an education and outreach opportunity for city staff. - Contains an O&M facility plan. - EMC Chapter 13.05 (Stormwater Manual – Site Development Regulations) updated by Ordinance 16-482 on November 8, 2016. - The City has adopted the 2015 Pierce County Stormwater Management and Site Development Manual (PCM).	No gaps identified.	NA	NA
S5.C.4.b – Permitting process with site plan review, inspection, and enforcement i. Review of all stormwater site plans for proposed development activities.	Based on 2016 Annual Report: 119 stormwater site plans were reviewed. Based on Questionnaire: - Each plan is carefully reviewed for conformance with the adopted manual, including review and verification of calculations, existing conditions, and potential impacts to adjacent areas/property. - The City has developed the following handouts for project proponents: - Surface Water Compliance Application www.cityofedgewood.org/document_center/Surface_Water_Compliance_Application1.pdf - Surface Water Compliance Application Information Sheet www.cityofedgewood.org/document_center/Surface_Water_Information_Sheet.pdf - Storm Drainage Minimum Design Requirements for Small Projects www.cityofedgewood.org/document_center/SD%20Minimum%20Requirements%20(2016-12-01).pdf	- Update Surface Water Compliance Application and Surface Water Compliance Application Information Sheet for consistency with the 2015 PCM. - Post SWPPP short form on City’s website. - Consider developing additional checklist(s) and/or BMP sizing guidance.	\$25,000 (one-time)	Minor edits to existing handouts and posting the SWPPP short form can be completed with current staffing. Development of up to 5 new checklists assumes an external support budget of 150 hours at a rate of \$100/hour. Development of simplified BMP sizing guidance assumes an external support budget of 100 hours at a rate of \$100/hour.
S5.C.4.b – Permitting process with site plan review, inspection, and enforcement ii. Inspect, prior to clearing and construction, all permitted development sites that have a high potential for sediment transport as determined through plan review based on definitions and requirements in Appendix 7 Determining Construction Site Sediment Damage Potential ... iii Inspect all permitted development sites during construction to verify proper installation and maintenance of required erosion and sediment controls. Enforce as necessary based on the inspection. iv. Inspect all permitted development sites upon completion of construction and prior to final approval or occupancy to ensure proper installation of permanent stormwater facilities ...”	Based on 2016 Annual Report: 30 construction sites inspected prior to construction. 73 construction sites inspected during construction. 1 enforceable action taken. Based on the 2017 SWMP: - Staff inspect all permitted development sites prior to clearing and construction activity. - Staff verify installation and maintenance of temporary erosion and sediment control (TESC) and stormwater BMPs. - Enforcement actions are based on inspection results and Citizen Action Requests. Based on 5/12/17 kickoff meeting with City Staff: - New Engineering tech performs in-house inspection program.	No gaps identified.	NA	NA

Table A-1 (continued). City of Edgewood Stormwater Management Program Activities and Recommendations.				
Permit Section	Current Activities	Recommendations	Additional Support Needed (staff/funding)	Support Assumptions
Controlling Runoff from New Development, Redevelopment, and Construction Sites (continued)				
S5.C.4.c – Long term operations and maintenance of stormwater treatment and flow control BMPs/facilities i. Implementation of an ordinance or other enforceable mechanism that clearly identifies the party responsible for maintenance, requires inspection of facilities ... and establishes enforcement procedures.	Based on the 2017 SWMP: EMC Chapter 13.05 (Stormwater Manual – Site Development Regulations) updated by Ordinance 16-482 on November 8, 2016.	No gaps identified.	NA	NA
ii. Each Permittee shall establish maintenance standards that are as protective or more protective of facility function than those specified in Chapter 4 of Volume V of the Stormwater Management Manual for Western Washington. For facilities which do not have maintenance standards, the Permittee shall develop a maintenance standard.	- Policy requires that stormwater facilities are owned and maintained by HOAs, property owners, or another private party. The developer is required to execute and record an <i>Agreement to Maintain Stormwater Facilities and Implement a Pollution Source Control Plan</i>: - O&M Plan and facility inspection requirements. - Requires annual inspection and reporting by responsible party which is an education and outreach opportunity for city staff. - The City has adopted the 2015 PCM which includes maintenance standards.	No gaps identified.	NA	NA
iii. Annual inspections of all stormwater treatment and flow control BMPs/facilities that discharge to the MS4 and were permitted by the Permittee according to S5.C.4.b ... iv. Inspections of all permanent stormwater treatment and flow control BMPs/facilities and catch basins in new residential developments every six months until 90 percent of the lots are constructed ... vii. The program shall include a procedure for keeping records of inspections and enforcement actions by staff, including inspection reports, warning letters, notices of violations, and other enforcement records ..."	The City is performing construction inspections (per S5.C.4.c.iv), but is not performing ongoing annual inspections of private stormwater treatment and flow control BMPs/facilities (per S5.C.4.c.iii).	- Finalize private facility database. - Develop a list of private facilities that are required to be inspected. - Finalize access easements with landowners to perform private facility inspections. - Submit a G20 Non-Compliance Notification letter to Ecology with a plan and a schedule for complying with the private facility inspection requirement.	320 hours (0.18 FTE)	Initial and ongoing effort to keep private facility database, access easements, and mapping up to date is estimated as 160 hours per year. Conducting annual private stormwater facility inspections is estimated as 160 hours per year.
S5.C.4.d – Notice of Intent copies "The program shall make available as applicable copies of the "Notice of Intent for Construction Activity" and copies of the "Notice of Intent for Industrial Activity" to representatives of proposed new development and redevelopment."	Based on 2016 Annual Report: Copies are provided.	No gaps identified.	NA	NA

Table A-1 (continued). City of Edgewood Stormwater Management Program Activities and Recommendations.				
Permit Section	Current Activities	Recommendations	Additional Support Needed (staff/funding)	Support Assumptions
Controlling Runoff from New Development, Redevelopment, and Construction Sites (continued)				
S5.C.4.e – Ongoing staff training program to control stormwater runoff “Each Permittee shall ensure that all staff whose primary job duties are implementing the program to control stormwater runoff from new development, redevelopment, and construction sites, including permitting, plan review, construction site inspections, and enforcement, are trained to conduct these activities. Follow-up training shall be provided as needed to address changes in procedures, techniques or staffing. Permittees shall document and maintain records of the training provided and the staff trained.”	Based on 2016 Annual Report: - Two City staff are Construction Erosion and Sediment Control Lead (CESCL) certified. - Staff currently receive on-the-job training.	- Identify additional off-site trainings related to permitting, plan review, construction site inspections, and enforcement such as: - Statewide LID Training Program: www.wastormwatercenter.org/lidswtrainingprogram - Ecology SWMMWW Training: www.ecy.wa.gov/programs/wq/stormwater/manual/2014SWMMWWinteractive/2014%20SWMMWW.htm#Resources/DocsForDownload/TrainingVideos/August2016Training/August2016Training.html - PCM Training - Develop template and populate training tracking log with City training records.	NA	Complete with current staffing.
S5.C.4.f – LID code related requirements “i. Permittees shall review, revise and make effective their local development-related codes, rules, standards, or other enforceable documents to incorporate and require LID principles and LID BMPs ... ii. The summary shall include existing requirements for LID principles and LID BMPs in development-related codes ...”	Based on the 2017 SWMP: - Revised local development code, rules, and standards to incorporate LID principles so it is the preferred commonly used approach to site development. Based on 2016 Annual Report: - City of Edgewood – LID Review and Revision Summary submitted with 2016 Annual Report. - EMC 13.05 (Stormwater Manual – Site Development Regulations) updated by Ordinance 16-482 on November 8, 2016.	No gaps identified.	NA	NA
S5.C.4.g – Watershed-scale stormwater planning	The City is not a participant.	Not applicable to the City because it is not located in any of the proposed Phase I basins.	NA	NA
Controlling Runoff from New Development, Redevelopment, and Construction Sites Subtotal			320 hours (0.18 FTE) and \$25,000 (one time)	
Municipal Operations and Maintenance (O&M)				
S5.C.5.a – Implement SWMMWW O&M standards or equivalent “Each Permittee shall implement maintenance standards that are as protective, or more protective, of facility function than those specified in Chapter 4 of Volume V of the Stormwater Management Manual for Western Washington ...”	The City has adopted the 2015 Pierce County Stormwater Management and Site Development Manual (PCM).	No gaps identified.	NA	NA
S5.C.5.b – Annual inspection of stormwater treatment and flow control facilities/BMPs “Annual inspection of all municipally owned or operated permanent stormwater treatment and flow control BMPs/facilities, and taking appropriate maintenance actions in accordance with the adopted maintenance standards.”	Based on questionnaire responses: - Annual inspection frequency of city-owned facilities. Based on 2016 Annual Report: - There are 10 municipally owned facilities, all of which were inspected and maintained last year.	No gaps identified.	NA	NA

Table A-1 (continued). City of Edgewood Stormwater Management Program Activities and Recommendations.				
Permit Section	Current Activities	Recommendations	Additional Support Needed (staff/funding)	Support Assumptions
Municipal O&M (continued)				
S5.C.5.c – Spot checks of potentially damaged stormwater treatment and flow control facilities/BMPs “Spot checks of potentially damaged permanent stormwater treatment and flow control BMPs/facilities after major storm events (24 hour storm event with a 10 year or greater recurrence interval).”	Based on questionnaire responses: - Both Pierce County staff and City staff are responsible for spot checks. - City staff are mostly responsible for spot checks during storm events. - Spot checks are performed annually at a minimum. - Spot checks are performed before forecasted significant storm events. - Spot checks are performed after major storm events.	No gaps identified.	NA	NA
S5.C.5.d – Inspection of catch basins and inlets “... inspection of all catch basins and inlets owned or operated by the Permittee at least once no later than August 1, 2017, and every two years thereafter ...”	Based on 2016 Annual Report: 1725 CBs, 767 inspected in 2016, 175 cleaned in 2016. Based on questionnaire responses: - Based on the ILA, Pierce County staff perform a majority of the catch basin inspections and clean as needed based on inspection results. - City staff perform inspections on demand as flooding and other problems arise.	No gaps identified.	NA	NA
S5.C.5.f – Practices, policies, and procedures to reduce stormwater impacts “Implement practices, policies and procedures to reduce stormwater impacts associated with runoff from all lands owned or maintained by the Permittee, and road maintenance activities under the functional control of the Permittee ... The following activities shall be addressed: - Pipe cleaning - Cleaning of culverts that convey stormwater in ditch systems - Ditch maintenance - Street cleaning - Road repair and resurfacing, including pavement grinding - Snow and ice control - Utility installation - Pavement striping maintenance - Maintaining roadside areas, including vegetation management - Dust control - Application of fertilizers, pesticides, and herbicides according to the instructions for their use, including reducing nutrients and pesticides using alternatives that minimize environmental impacts - Sediment and erosion control - Landscape maintenance and vegetation disposal - Trash and pet waste management - Building exterior cleaning and maintenance”	Based on questionnaire responses: - Pierce County has a maintenance contract to perform regular street sweeping. - The City owns a skid steer and small dump truck for performing small maintenance tasks without County involvement. Based on 5/12/17 kickoff meeting: - City has adopted Pierce County SOPs with some modifications.	Finalize SOPs documenting City practices, policies, and procedures.	80 hours (0.05 FTE)	Initial and ongoing effort to finalize SOPs with internal staff, review annually, incorporate necessary updates, and track regional programs that may trigger updates.

Table A-1 (continued). City of Edgewood Stormwater Management Program Activities and Recommendations.				
Permit Section	Current Activities	Recommendations	Additional Support Needed (staff/funding)	Support Assumptions
Municipal O&M (continued)				
S5.C.5.g – Ongoing training program to protect water quality “Implement an ongoing training program for employees of the Permittee whose primary construction, operations or maintenance job functions may impact stormwater quality. The training program shall address the importance of protecting water quality, operation and maintenance standards, inspection procedures, selecting appropriate BMPs, ways to perform their job activities to prevent or minimize impacts to water quality, and procedures for reporting water quality concerns. Follow-up training shall be provided as needed to address changes in procedures, techniques, requirements, or staffing. Permittees shall document and maintain records of training provided and the staff trained.”	Based on the 2017 SWMP: - Two City staff are CESCL certified. Based on Pierce County’s 2017 SWMP: - Pierce County Maintenance crews receive quarterly Stormwater Pollution Prevention Plan (SWPPP) and BMP trainings from the County’s NPDES Stormwater Permit Training Coordinator. - Road Operations provides ongoing CESCL hands-on refreshers and quarterly safety meetings that cover Regional Roads Maintenance Endangered Species Act (ESA) Program Guidelines topics and other stormwater pollution prevention BMP issues, including SWPPP related issues.	- Request training records from Pierce County from County crews that perform City’s O&M activities. - Develop template and populate training tracking log with City and County training records.	NA	Complete with current staffing.
S5.C.5.h – SWMPPP implementation “Implement a Stormwater Pollution Prevention Plan (SWPPP) for all heavy equipment maintenance or storage yards, and material storage facilities owned or operated by the Permittee in areas subject to this Permit ...”	Based on questionnaire responses: The City does not currently have any City facilities that require a SWPPP.	No gaps identified.	NA	NA
S5.C.5.i – Maintain records of inspections and maintenance “Maintain records of inspections and maintenance or repair activities conducted by the Permittee.”	Based on questionnaire responses: - Pierce County tracks inspections through GIS database and project/activity billing and invoices. - City staff track inspections through hardcopy report forms.	No gaps identified.	NA	NA
Municipal O&M Subtotal			80 hours (0.05 FTE)	
Compliance with Total Maximum Daily Load (TMDL) Requirements				
Implement TMDL requirements.	Based on the 2017 SWMP: - The City is part of the Puyallup TMDL for fecal coliform bacteria listed in Appendix 2 of the NPDES Permit. - The City is required to track construction activities in the basin and prioritize field screening for illicit discharges. Several permitted construction activities occurred in 2016; however, no illicit discharges were detected from these construction sites. The City also did not detect any illicit discharges during routine field screening.	No gaps identified.	NA	NA
Comply with applicable TMDLs not in the permit.	Does not apply.	No gaps identified.	NA	NA
Comply with permit modifications and TMDL implementation plans.	Does not apply.	No gaps identified.	NA	NA
Compliance with TMDL Requirements Subtotal			NA	

Table A-1 (continued). City of Edgewood Stormwater Management Program Activities and Recommendations.				
Permit Section	Current Activities	Recommendations	Additional Support Needed (staff/funding)	Support Assumptions
Monitoring and Assessment				
Description of stormwater monitoring or stormwater-related investigations.	Based on the 2017 SWMP: Hydrologic Surface Water Analysis commissioned for 108th Avenue East neighborhood (not yet complete).	Provide a description of the study (and a summary of the results when available) in the annual report to Ecology.	NA	Complete with current staffing.
Regional Stormwater Monitoring Program participation.	Based on the 2017 SWMP: The City contributes to a collective fund to implement RSMP.	No gaps identified.	NA	NA
Monitoring and Assessment Subtotal			NA	
Reporting				
Submit annual report.	The City submits annual reports as required by Ecology.	No gaps identified.	NA	NA
Maintain records for 5 years.	Records related to the permit will be kept for at least 5 years as required by the Permit.	No gaps identified.	NA	NA
Make records available to the public.	The City makes records available to the public upon request.	No gaps identified.	NA	NA
Internal coordination mechanisms summary.	Internal coordination mechanisms summary was submitted with the 2014 Annual Report: www.cityofedgewood.org/Edgewood_Policy_internal_coordination.pdf .	No gaps identified.	NA	NA
Reporting Subtotal			NA	
Total			\$50,000 (one-time) \$1,000 (ongoing) 840 hours (0.48 FTE) (ongoing)	

APPENDIX B

Characteristics of Edgewood's Closed Depression Basins or Potholes

Table B-1. Characteristics of Edgewood’s Closed Depression Basins or Potholes.							
Pothole Name	Size of Catchment (acres)	Storage Volume During Flood (acre-feet)	Flooding Impacts on Private Property ^a	Roadways Impacted ^a	Related 1997 CIP IDs ^a	1997 Flooding Extents ^a	Comments
Edgewood Bowl Pothole	648	355 (based on an elevation of 334 feet)	House crawlspace flooding, house septic system flooding, driveway eroded	110th Avenue E, 114th Avenue E, closed due to flooding	EB-1 through EB-10	64-acre flooded area	The Edgewood Pothole has the largest contributing area and is therefore the greatest priority in terms of developing flood reduction plans. The City owns an undeveloped property in this basin near 110th Avenue and 16th Street. There are some wetlands on site that need to be delineated and surveyed, and the site is approximately 4 acres in area.
Lake Chalet	135	32 (based on an elevation of 358 feet)	Two private properties flooding	29th Street E, 103rd Avenue Court E, flooding	LC-1 through LC-3	13-acre flooded area	Most area around the pothole is not ideal for a UIC wellfield because there are two drinking water source wells near the shore. Additionally, there are many septic systems in close proximity, so water quality concerns are high; but LID could be used to address water quality concerns. The closest stormwater main is 6 feet too high for gravity flow flood relief from the lake. One possible solution may be an inverted siphon to this elevated pipe.
Pinedale Pond (114th Avenue) Pothole	384	227 (based on an elevation of 382 feet)	House flooded, two private properties flooded, driveway flooded	32nd Street E (at peak flood), 24th Street, and 117th Avenue	114-1 through 114-5	48 acres	The City is pursuing a Conservation Futures grant for property acquisition along the pothole that would include wetland restoration, passive recreation opportunities, and stormwater management.
108th Avenue Pothole	224	174 (based on an elevation of 382 feet)	Two houses flooded	108th Avenue, 32nd Street, 36th Street flooding	108-1 through 108-5	30 acres	There is no City-owned property in this basin yet, although a potential acquisition opportunity has been identified near the intersection of 110th Avenue and 32nd Street (location of a home that experiences persistent flooding).
122nd Avenue Pothole	329	160 (based on an elevation of 382 feet)	Meadow Vista tracts flooded, driveway to a home on 122nd Avenue E has flooded, water levels approaching lower homes nearby	No public road impacts	122-1 through 122-2	23 acres	The nearby elementary school site presents a potential infiltration opportunity site.
Surprise Lake Pothole	49	32 (based on an elevation of 334 feet)	One house flooded, one septic system flooded	No public road impacts	SLP-1, SLP-2	4.3 acres	There is a commercial property owner who is amenable to investigative work.

^a Source: 1997 Plan and communications with City staff.

APPENDIX C

Project Summary Sheets (for projects scheduled for implementation under this plan)



City of Edgewood Stormwater Capital Improvement Program Project Summary Sheet

Name: Edgewood Pothole Pilot Project Feasibility Assessment

2017 Project Number: NA

2009 Project Number: NA

1997 Project Number: NA

CIP List Priority: 3

Estimated Cost: \$460,000

PROBLEM DESCRIPTION

The City of Edgewood has six closed depression basins that receive stormwater runoff from surrounding neighborhoods and frequently flood during the winter months. A detailed alternatives assessment for addressing this stormwater problem was performed as part of developing the City's current surface water management plan in 1997, including options such as: excavating the flood fringe areas within the basins to provide additional storage, and direct conveyance of stormwater into nearby streams, further compounding regional flood control issues. Water elevation and water quality data is needed to determine the volume of water to be controlled as well as treatment needs in each pothole. Geotechnical and groundwater level data will also be collected in coordination with Mt. View - Edgewood Water Company, the local water purveyor, to evaluate subsurface conditions.

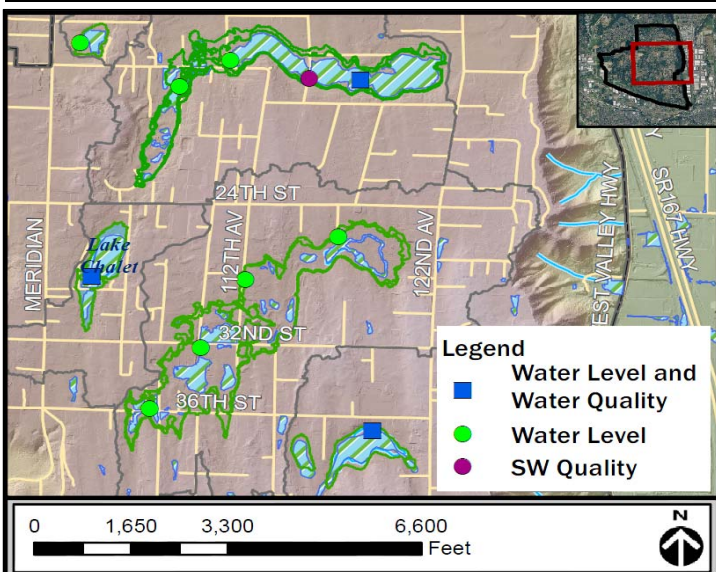
PROPOSED SOLUTION

Infiltrating stormwater using a UIC wellfield is one proposed alternative to reduce flooding. This feasibility assessment will evaluate; 1) whether an advanced stormwater treatment and UIC wellfield can adequately treat stormwater and ensure protection of the drinking water supply, and 2) the volume of water that can be controlled (i.e., the flood reduction capacity of the system). First, water elevation, water quality (color, nutrients, bacteria, copper and zinc), and groundwater data will be collected to evaluate infiltration feasibility at the candidate site and confirm subsurface conditions such as aquifer and till layer depths. A conceptual design for the system will be developed based on monitoring and modeling data. The monitoring data will be used to develop an existing conditions hydrologic and hydraulic model of the pothole. The model will be used to size a UIC well field and advanced bioretention treatment facility as part of a preliminary design. Feasibility assessment will be prepared in coordination with Mt. View - Edgewood Water Company, the local water purveyor. Throughout the project, public and advisory group meetings will be held to inform the public and stakeholders about project progress and findings.

COST ESTIMATE ASSUMPTIONS

The cost estimate for initial data collection includes purchase and installation of automated pressure transducers and staff gauges for continuous water level monitoring in each of the 6 main potholes and 3 subpotholes, cost for laboratory analysis water samples (4 monthly samples and 3 storm samples), development of a rating curve for each pothole, and costs for field visits to calibrate equipment and collect data and samples. Data collection also includes groundwater level monitoring with 4 borings (3 to 100 ft, 1 up to 300 ft). Selection of boring locations will be coordinated with MTVE.

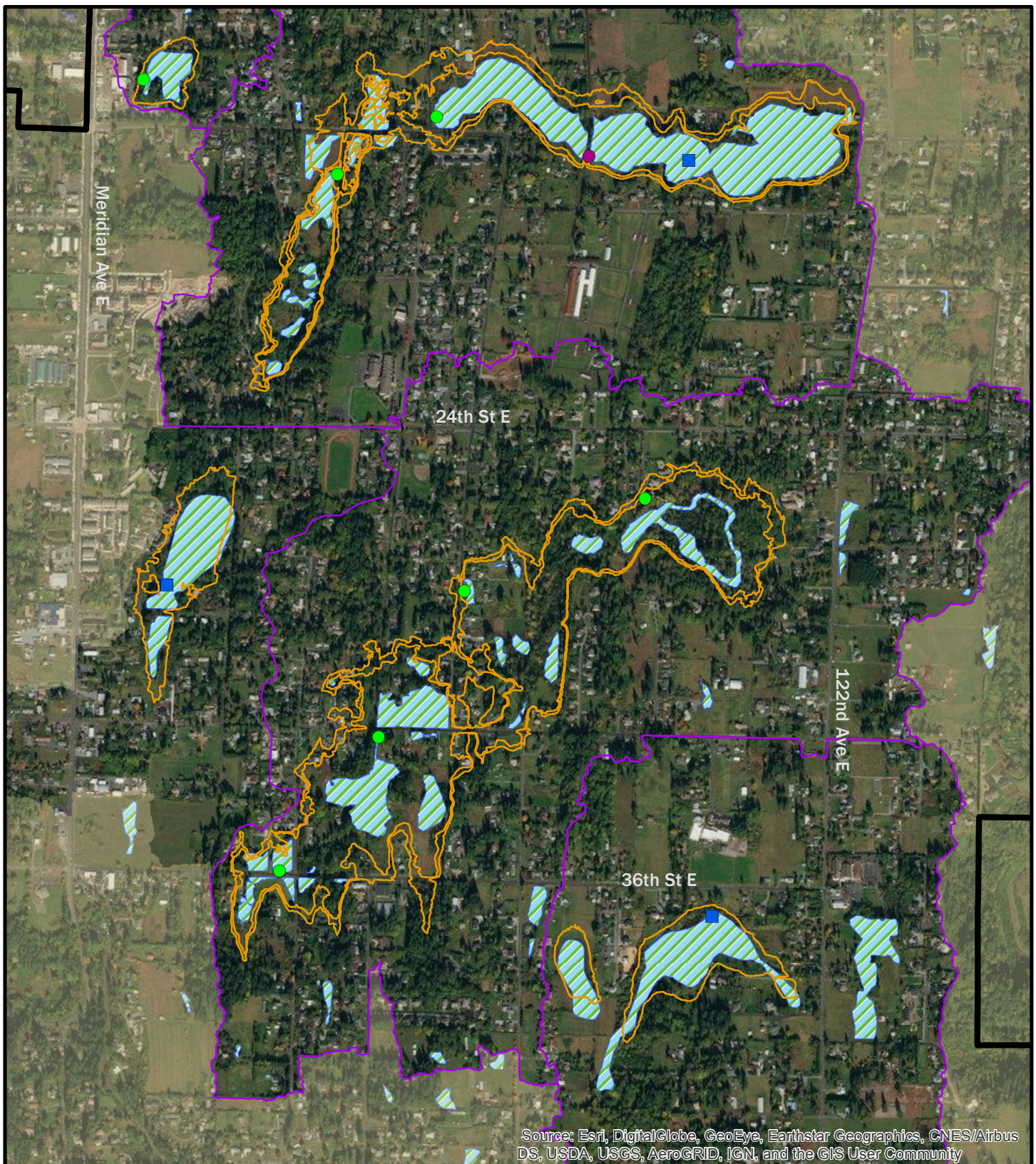
The cost estimate for the feasibility analysis using the collected data (including community engagement, modeling, and feasibility analysis) is based on recent and ongoing similar work on stormwater treatment facility and UIC design, modeling, and community engagement projects in Western Washington, as well as ongoing research related to treatment media.



Approximate monitoring locations



Edgewood Bowl pothole flooding

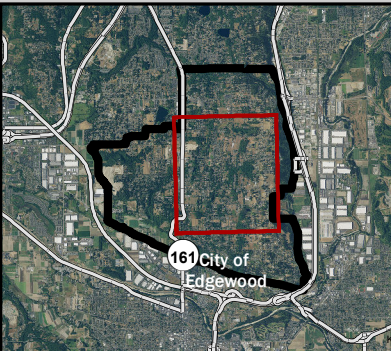


Legend

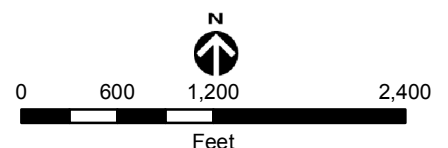
- Edgewood city limits
- Pothole flood elevations
- Pothole catchment areas
- Wetlands

Monitoring Locations*

- Water level and water quality
- Stormwater quality * Subject to change depending on access and field investigation
- Water level



Pothole Water Level and Water Quality Monitoring



08/07/18 Study Session

Cost Estimate for Edgewood Pothole Pilot Project Feasibility Assessment	
Tasks	Estimated Cost
Task 1 – Project Management	\$50,000
Task 2 – Community Engagement	\$50,000
Task 3 – Baseline Characterization Monitoring	\$200,000
Task 4 – Hydrologic and Hydraulic Modeling	\$75,000
Task 5 – Feasibility Assessment and Conceptual Design	\$80,000
Total Cost	\$460,000

Itemized Costs By Task	
Tasks	Estimated Cost
Task 1 - Project Management	Subtask Cost
Records Maintenance	\$5,000
Requests for Reimbursement	\$6,000
Quarterly Progress Reports	\$4,000
Project Oversight and Coordination	\$30,000
Project Outcome Summary Report	\$5,000
Task 1 Total	\$50,000
Task 2 - Community Engagement	
Advisory Group Meeting 1	\$6,000
Advisory Group Meeting 2	\$6,000
Advisory Group Meeting 3	\$6,000
Advisory Group Meeting 4	\$6,000
Public Meeting 1	\$8,000
Public Meeting 2	\$9,000
Public Meeting 3	\$9,000
Task 2 Total	\$50,000
Task 3 - Baseline Conditions Monitoring	
See Baseline Conditions Monitoring Scope and Budget Upload Document	\$200,000
Task 4 - Hydrologic and Hydraulic Modeling	
Draft Modeling QAPP	\$8,000
Final Modeling QAPP	\$2,000
Develop Existing Conditions Model	\$10,000
Calibrate Existing Conditions Model	\$20,000
Model Facility Performance	\$20,000
Draft Modeling Results Technical Memorandum	\$10,000
Final Modeling Results Technical Memorandum	\$5,000
Task 4 Total	\$75,000
Task 5 - Feasibility Assessment and Conceptual Design and Cost Estimating	
Feasibility Assessment	\$20,000
Draft Feasibility Assessment Technical Memorandum	\$10,000
Final Feasibility Assessment Technical Memorandum	\$5,000
Facility Sizing and Configuration	\$20,000
Cost Estimating	\$5,000
Draft Predesign Report and Cost Estimate	\$15,000
Final Predesign Report and Cost Estimate	\$5,000
Task 5 Total	\$80,000

HERRERA ENVIRONMENTAL CONSULTANTS

City of Edgewood Pothole Water Level and Water Quality Monitoring
Herrera Project No. 17-06504-000

Water Level and Water Quality Monitoring Number of Tasks: 5				Task 1.0 Project Management		Task 2.0 Underground Injection Control Feasibility Analysis		Task 3.0 Water Level Monitoring		Task 4.0 Water Quality Monitoring		Task 5.0 Reporting		TOTAL	
COST SUMMARY															
Labor				\$7,585		\$2,442		\$24,153		\$5,844		\$17,911		\$57,935	
Travel and per diem				\$0		\$0		\$514		\$32		\$0		\$546	
Other direct costs (ODCs)				\$0		\$0		\$7,386		\$0		\$0		\$7,386	
Subconsultants				\$0		\$115,500		\$5,250		\$0		\$0		\$120,750	
Analytical laboratory				\$0		\$0		\$0		\$11,340		\$0		\$11,340	
GRAND TOTAL				\$7,585		\$117,942		\$37,302		\$17,216		\$17,911		\$197,957	
COST ITEMIZATION															
Labor (2017 rates)															
Personnel Rate/Hour				Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost
Principal				28	\$6,282	8	\$1,795	12	\$2,692	3	\$673	8	\$1,795	59	\$13,237
Sr. Engineer					\$0	4	\$647		\$0		\$0	17	\$2,749	21	\$3,396
Scientist					\$0		\$0	166	\$21,460	40	\$5,171	96	\$12,411	302	\$39,043
Engineer					\$0		\$0		\$0		\$0	10	\$956	10	\$956
Administrative Coordinator				12	\$1,304		\$0		\$0		\$0		\$0	12	\$1,304
SUBTOTAL LABOR (Burdened Labor)				40	\$7,585	12	\$2,442	178	\$24,153	43	\$5,844	131	\$17,911	404	\$57,935
TRAVEL AND PER DIEM COSTS Unit Cost				Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost
Auto Use Mile \$0.535				0	\$0.00	0	\$0.00	960	\$513.60	60	\$32.10	0	\$0.00	1020	\$546
SUBTOTAL TRAVEL AND PER DIEM					\$0		\$0		\$514		\$32		\$0		\$546
OTHER DIRECT COSTS (ODCs) Unit Cost				Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost
Field Equipment and Supplies															
Computer, laptop Day \$50				0	\$0.00	0	\$0.00	12	\$600.00	0	\$0.00	0	\$0.00	12	\$600
In-Situ RuggedTroll 100's (0-30 feet) Each \$420				0	\$0.00	0	\$0.00	10	\$4,200.00	0	\$0.00	0	\$0.00	10	\$4,200
In-Situ RuggedBaroTroll Each \$420				0	\$0.00	0	\$0.00	1	\$420.00	0	\$0.00	0	\$0.00	1	\$420
Docking Station Each \$225				0	\$0.00	0	\$0.00	1	\$225.00	0	\$0.00	0	\$0.00	1	\$225
2-inch well dock (stainless steel ring) Each \$21				0	\$0.00	0	\$0.00	10	\$210.00	0	\$0.00	0	\$0.00	10	\$210
Screened sch 40 (0.0100) 10-foot PVC Each \$24				0	\$0.00	0	\$0.00	6	\$144.00	0	\$0.00	0	\$0.00	6	\$144
2-inch caps (well ends) Each \$7				0	\$0.00	0	\$0.00	6	\$42.00	0	\$0.00	0	\$0.00	6	\$42
Sand (50 lbs) Each \$15				0	\$0.00	0	\$0.00	3	\$45.00	0	\$0.00	0	\$0.00	3	\$45
Well locking cap (2-inch gripNlock) Each \$20				0	\$0.00	0	\$0.00	10	\$200.00	0	\$0.00	0	\$0.00	10	\$200
Green Vinyl-coated cable Each \$100				0	\$0.00	0	\$0.00	1	\$100.00	0	\$0.00	0	\$0.00	1	\$100
Ferrules Each \$2				0	\$0.00	0	\$0.00	20	\$40.00	0	\$0.00	0	\$0.00	20	\$40
Combination Lock Each \$16				0	\$0.00	0	\$0.00	10	\$160.00	0	\$0.00	0	\$0.00	10	\$160
Staff Gauge Each \$100				0	\$0.00	0	\$0.00	10	\$1,000.00	0	\$0.00	0	\$0.00	10	\$1,000
SUBTOTAL ODCs					\$0		\$0		\$7,386		\$0		\$0		\$7,386
SUBCONSULTANT COSTS Unit Cost				Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost
Survey \$5,000				0	\$0.00	0	\$0	1	\$5,000	0	\$0.00	0	\$0.00	1	\$5,000
Driller \$60,000						1	\$60,000						1	\$60,000	
AESI \$50,000				0	\$0.00	1	\$50,000	0	\$0.00	0	\$0.00	0	\$0.00	1	\$50,000
Fee on Subconsultants @ x% 5%					\$0		\$5,500		\$250		\$0		\$0		\$5,750
SUBTOTAL SUBCONSULTANT					\$0		\$115,500		\$5,250		\$0		\$0		\$120,750
ANALYTICAL LABORATORY COSTS Unit Cost				Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost
ARI Laboratory \$270				0	\$0.00	0	\$0.00	0	\$0.00	42	\$11,340.00	0	\$0.00	42	\$11,340
SUBTOTAL LABORATORY					\$0		\$0		\$0		\$11,340		\$0		\$11,340



City of Edgewood Stormwater Capital Improvement Program Project Summary Sheet

Name: Lake Chalet Pothole Flood Reduction Project

2017 Project Number: NA

2009 Project Number: NA

1997 Project Number: LC-1 - LC-3

CIP List Priority: 4

Estimated Cost: \$400,000 - \$2,000,000

PROBLEM DESCRIPTION

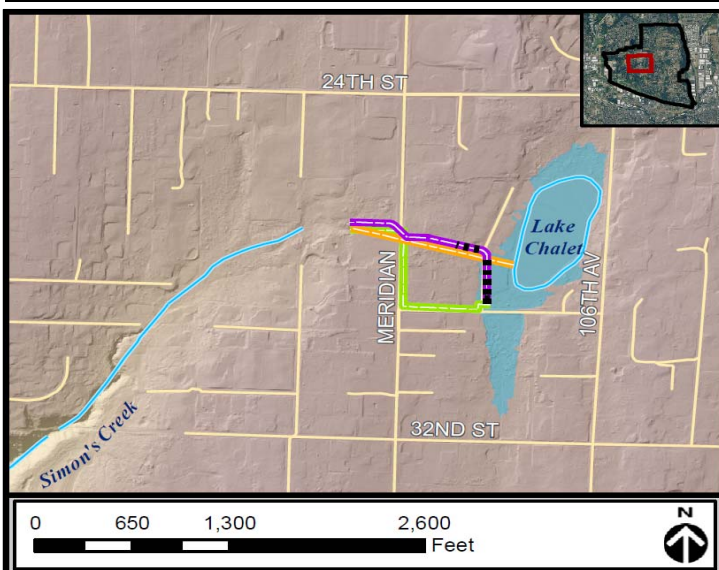
Historically, Lake Chalet overflowed to Simon's Creek; however, development has blocked that overflow pathway. As a result, even minor rainfall events lead to flooding of public streets and private property adjacent to Lake Chalet, including flooding of 29th Street E. The proximity to drinking water wells presents a challenge for infiltration for flood reduction at this pothole.

PROPOSED SOLUTION

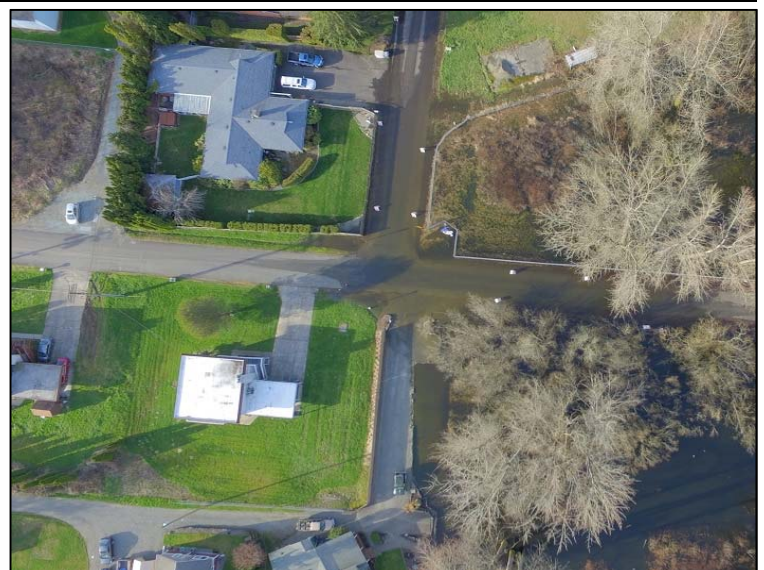
Three options to convey water from Lake Chalet to nearby Simon's Creek have been considered. The least expensive option, from a capital cost standpoint, is to pump water west from Lake Chalet to the intersection of 29th Street E and Meridian Avenue E, and then use gravity flow north along Meridian to a discharge point in the Simon's Creek ravine. This option would require long term pump station operations and maintenance, which is not accounted for in the capital project cost estimates. The second option, gravity flow along the same alignment, is more expensive to construct than the first option, but requires less long term operations and maintenance. The most expensive, but potentially least disruptive option, is a siphon through a horizontal directional drilled (HDD) tunnel, which may also require the least long term O&M. Any option selected would require a quantitative evaluation of potential impacts to streams or groundwater supply.

COST ESTIMATE ASSUMPTIONS

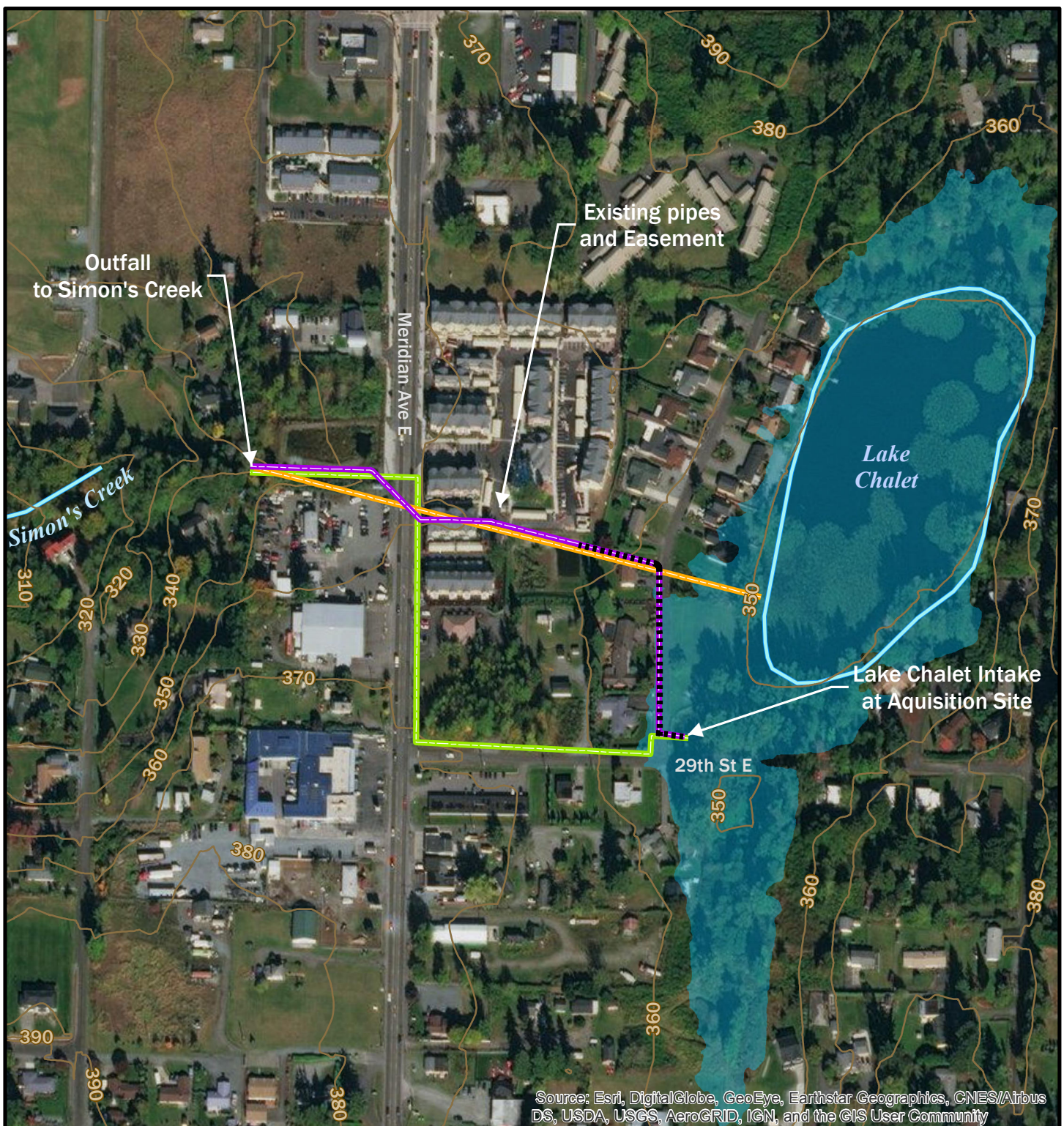
The pump and gravity flow option assumes 1 duplex pump station, electrical work, 600 LF of 4" force main, and connection to the existing storm sewer pipe. The gravity flow option assumes 1,800 LF of 18" storm sewer pipe. The siphon option assumes 1,200 LF of directional boring and associated 18" HDPE Pipe. All projects include an inlet structure and pavement, utility, and vegetation protection and restoration. The estimates do not account for the cost of easements, land acquisition, or mitigation in Simon's Creek. The estimates also do not include allied costs (design, modeling, permitting, City project management, etc.). A more detailed alternatives assessment may be necessary to select the preferred option.



Prospect location showing proposed pipe alignment



Flooding at Lake Chalet pothole



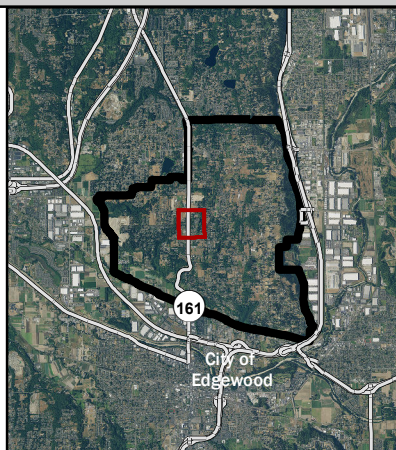
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

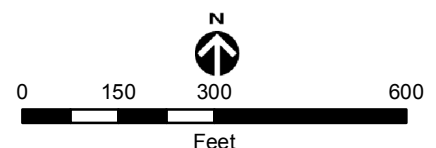
- Contours (10-foot)
- Stream or waterbody
- Flooded area at 358 ft

Conveyance Options

- Pump and gravity flow pipeline (open trench excavation)
Dashed line for pumped flow
- Gravity flow pipeline (open trench excavation)
- Gravity flow / siphon pipeline (HDD installation)



Lake Chalet Pothole Flooding



Engineering Construction Cost Estimate for "Conceptual Design and Order of Magnitude"

Project Name: Lake Chalet - Pump Station to Gravity Sewer Option
 Project Number: 17-06504-000
 Client: City of Edgewood



QA Review

Completed/Updated By: Kyle Johnson
 Last Updated On: 7/30/2017
 Reviewed By: Kevin Houck
 Reviewed On: 7/30/2017
 Approved By: Matt Fontaine
 Approved On: 8/9/2017
 Revised By: Meghan Mullen
 Revised On: 8/28/2017
 Reviewed/Approved On: Matt Fontaine
 Reviewed/Approved On: 8/28/2017

Item No.	Spec Section	Item Description	Qty	Unit	Unit Cost	Total Cost
	Div 1	General Requirements				
1		Mobilization	1	L.S.	8%	\$ 15,063
2		Erosion/Water Pollution Control	1	L.S.	2%	\$ 3,766
3		Utility Protection and Relocation	1	L.S.	5%	\$ 9,414
4		Project Temporary Traffic Control	1	L.S.	2%	\$ 3,766
	Div 2	Earthwork				
5		Remove A/C	178	S.Y.	\$ 20	\$ 3,556
6		Sewer line excavation (force main)	333	C.Y.	\$ 35	\$ 11,667
7		Sewer line backfill (force main)	256	C.Y.	\$ 35	\$ 8,944
	Div 3	Aggregate Production and Acceptance				
8		Pipe Bedding	600	L.F.	\$ 8	\$ 4,800
9		3/4" Minus Crushed Gravel	40	Ton	\$ 47	\$ 1,857
10		2 1/2" " Minus Crushed Rock	79	Ton	\$ 34	\$ 2,686
	Div 5	Surface Treatments and Pavements				
11		3" Asphalt	31	Ton	\$ 175	\$ 5,355
12		Grass restoration	4,800	S.F.	\$ 3	\$ 14,400
	Div 7	Drainage Structures, Storm Sewers, Sanitary Sewers, Water Mains, and Conduits				
14		Manholes	1	Each	\$ 11,000	\$ 11,000
15		Inlet structure	1	Each	\$ 30,000	\$ 30,000
16		Outlet structure	1	Each	\$ 10,000	\$ 10,000
16		12' diameter wet well	1	Each	\$ 35,000	\$ 35,000
17		Pumps (duplex), valving, control panel	1	Each	\$ 18,000	\$ 18,000
18		4" HDPE forcemain	600	L.F.	\$ 3	\$ 1,620
	Div 8	Miscellaneous Construction				
20		Dewatering	3	Day	\$ 1,805	\$ 5,415
21		Trench safety	3,000	S.F.	\$ 1	\$ 3,990
22		Electrical Service	1	L.S.	\$ 20,000	\$ 20,000
		Construction Subtotal				\$ 220,299
		Contingency	50%			\$ 110,150
		Subtotal (with +50% Contingency)				\$ 330,449
		Tax	9.4%			\$ 31,062
		Total (with Contingency and Tax)				\$ 400,000

Engineering Construction Cost Estimate for "Conceptual Design and Order of Magnitude"

Project Name: Lake Chalet - Gravity Sewer Option
 Project Number: 17-06504-000
 Client: City of Edgewood



QA Review

Completed/Updated By: Kyle Johnson
 Last Updated On: 7/30/2017
 Approved By: Matt Fontaine
 Approved On.: 8/9/2017
 Revised By: Meghan Mullen
 Revised On: 8/28/2017
 Reviewed/Approved On: Matt Fontaine
 Reviewed/Approved On: 8/28/2017

Item No.	Spec Section	Item Description	Qty	Unit	Unit Cost	Total Cost
	Div 1	General Requirements				
1		Mobilization	1	L.S.	8%	\$ 51,821
2		Erosion/Water Pollution Control	1	L.S.	2%	\$ 12,955
3		Utility Protection and Relocation	1	L.S.	10%	\$ 64,776
4		Project Temporary Traffic Control	1	L.S.	5%	\$ 32,388
	Div 2	Earthwork				
5		Remove A/C	778	S.Y.	\$ 20	\$ 15,556
6		Sewer line excavation	4,306	C.Y.	\$ 35	\$ 150,694
7		Sewer line backfill	3,657	C.Y.	\$ 35	\$ 128,009
	Div 3	Aggregate Production and Acceptance				
8		Pipe Bedding	1,500	L.F.	\$ 18	\$ 27,000
9		3/4" Minus Crushed Gravel	173	Ton	\$ 47	\$ 8,123
10		2 1/2" " Minus Crushed Rock	346	Ton	\$ 34	\$ 11,753
	Div 5	Surface Treatments and Pavements				
11		3" Asphalt	134	Ton	\$ 175	\$ 23,428
12		Grass restoration	24,000	S.F.	\$ 3	\$ 72,000
13		Trees	10	Each	\$ 500	\$ 5,000
	Div 7	Drainage Structures, Storm Sewers, Sanitary Sewers, Water Mains, and Conduits				
14		Manholes	4	Each	\$ 13,700	\$ 54,800
15		Inlet structure	1	Each	\$30,000	\$ 30,000
16		Outlet structure	1	Each	\$30,000	\$ 30,000
17		18" Gravity Sewer Pipe (PVC)	1,500	L.F.	\$ 21.00	\$ 31,500
	Div 8	Miscellaneous Construction				
18		Dewatering	10	Day	\$ 1,805	\$ 18,050
19		Trench safety	23,250	S.F.	\$ 1.80	\$ 41,850
		Construction Subtotal				\$ 809,705
		Contingency	50%			\$ 404,852
		Subtotal (with +50% Contingency)				\$ 1,214,557
		Tax	9.4%			\$ 114,168
		Total (with Contingency and Tax)				\$ 1,300,000

Engineering Construction Cost Estimate for "Conceptual Design and Order of Magnitude"

Project Name: Lake Chalet - Siphon HDD Option
 Project Number: 17-06504-000
 Client: City of Edgewood



QA Review

Completed/Updated By: Kyle Johnson
 Last Updated On: 7/30/2017
 Approved By: Matt Fontaine
 Approved On.: 8/9/2017

Item No.	Spec Section	Item Description	Qty	Unit	Unit Cost	Total Cost
	Div 1	General Requirements				
1		Mobilization	1	L.S.	8%	\$ 79,401
2		Erosion/Water Pollution Control	1	L.S.	2%	\$ 19,850
3		Utility Protection and Relocation	1	L.S.	10%	\$ 99,251
4		Project Temporary Traffic Control	2	L.S.	5%	\$ 49,626
	Div 2	Earthwork				
5		Entry and exit points	60	C.Y.	\$ 35	\$ 2,100
	Div 3	Aggregate Production and Acceptance				
6		3/4" Minus Crushed Gravel	30	Ton	\$ 47	\$ 1,410
	Div 5	Surface Treatments and Pavements				
7		Grass restoration	24,000	S.F.	\$ 3	\$ 72,000
8		Trees	10	Each	\$ 500	\$ 5,000
	Div 7	Drainage Structures, Storm Sewers, Sanitary Sewers, Water Mains, and Conduits				
9		Inlet structure	1	Each	\$ 30,000	\$ 30,000
10		Outlet structure	1	Each	\$ 30,000	\$ 30,000
11		Siphon Directional Bore	1	L.S.	\$ 760,000	\$ 760,000
12		18" HDPE Pipe	1,200	L.F.	\$ 35	\$ 42,000
13		18" Fusing and Handling	1	L.S.	\$ 50,000	\$ 50,000
		Construction Subtotal				\$ 1,240,638
		Contingency	50%			\$ 620,319
		Subtotal (with +50% Contingency)				\$ 1,860,956
		Tax	9.4%			\$ 174,930
		Total (with Contingency and Tax)				\$ 2,000,000



City of Edgewood Stormwater Capital Improvement Program

Project Summary Sheet

Name: Pothole Flood Reduction Plans

2017 Project Number: NA

2009 Project Number: 32

1997 Project Number: NA

CIP List Priority: 8, 10-13

Estimated Cost: \$850,000

PROBLEM DESCRIPTION

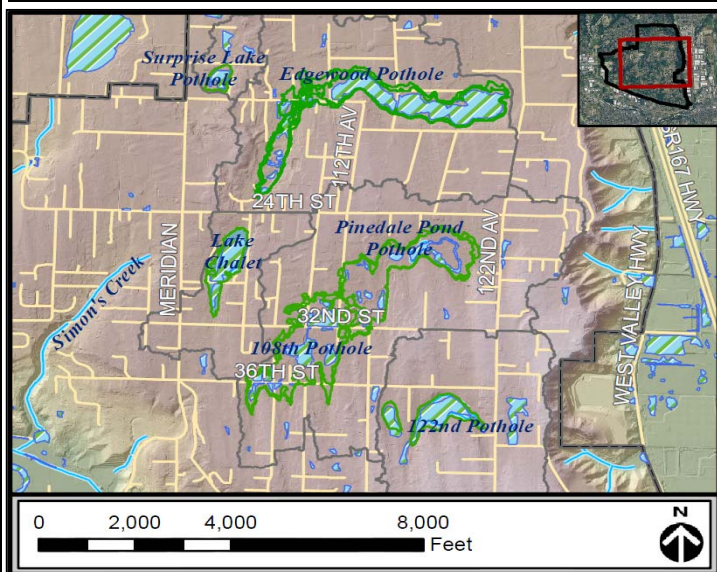
More information is needed to select the best solution to flooding problems in the Edgewood potholes. Pothole specific flood reduction plans need to be developed for five potholes: Edgewood Bowl, Pinedale Pond, 108th Street E, Surprise Lake, and 122nd Avenue E. Each of these potholes has individual characteristics that will need to be understood before developing a flood control plan, (eg., flood elevation, available storage volume, stormwater conveyance network, basin characteristics). Water level monitoring done via a separate CIP project as well as the findings from the feasibility assessment for the Edgewood Bowl pothole will inform these projects.

PROPOSED SOLUTION

Basin characteristics, hydrologic data, and other information from the water level and water quality monitoring project will be used to develop a continuous hydrologic and hydraulic model of the existing conditions in each pothole and then used to develop and evaluate different solution alternatives, starting with the Edgewood Bowl pothole. An initial report will be developed describing the pothole characteristics, modeling results and the alternatives. At least one meeting will be held with the public to discuss results, alternatives considered and recommendations. The solutions will be compared, and the best alternative will be selected. The models will also be used as the basis for a flood study to update FEMA maps of the potholes and potentially result in a letter of map revision (LOMR) for each pothole. The total cost assumes development of five individual flood reduction plans at approximately \$170,000 each.

COST ESTIMATE ASSUMPTIONS

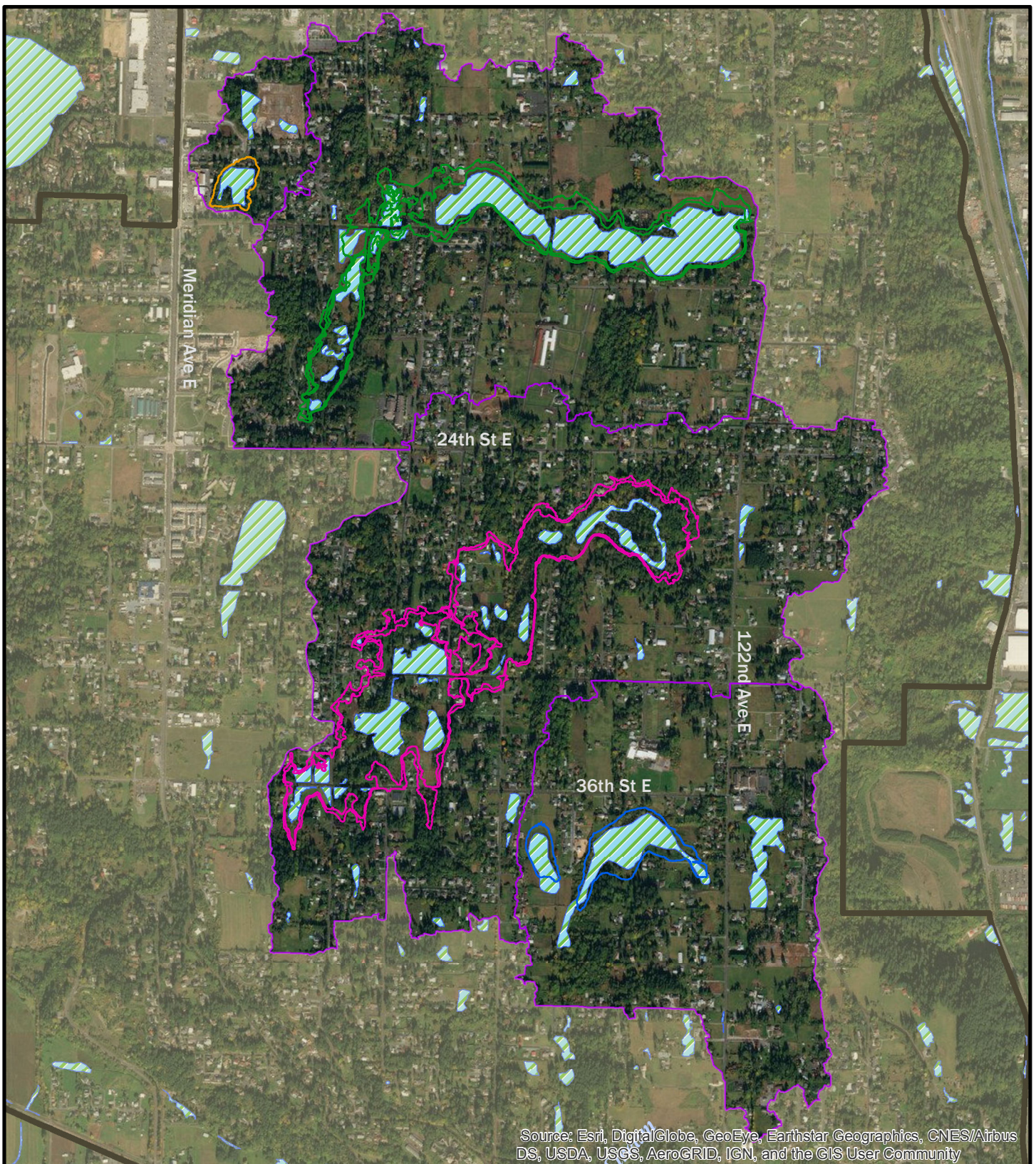
Cost estimate assumptions are based on consultant experience with similar projects and includes public involvement, existing conditions assessment, modeling, development and prioritization of alternatives, a FEMA letter of map revision and development of a plan. The Mountain View Edgewood Water Company (MTVE) has offered to participate financially in raising roads to move their water mains out of flooded areas, if this is one or part of a solution.



Pothole locations

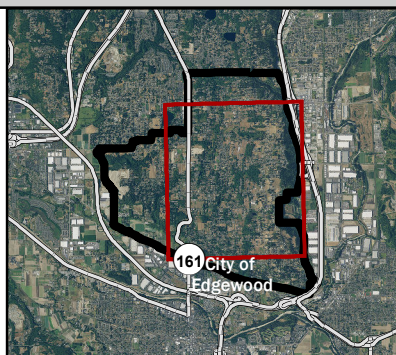


Edgewood Bowl pothole flooding

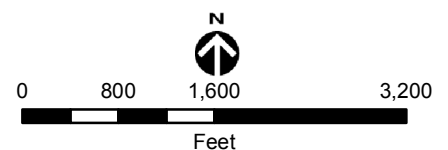


Legend

- Pinedale Pond and 108th St potholes
- Surprise Lake pothole
- 122nd Ave E pothole
- Edgewood pothole
- Pothole catchment areas
- ▨ Wetlands
- Edgewood City Limits



Pothole Flood Reduction Plans



Cost Estimate for Pothole Flood Reduction Plans.	
Tasks	Estimated Cost
Task 1 – Project Management	\$18,000
Task 2 Public and Stakeholder Outreach	\$10,000
Task 3 – Hydrologic and Hydraulic Analysis of Existing Conditions	\$20,000
Task 4 – Existing Conditions Assessment and Modeling Report	\$20,000
Task 5 – Alternatives Development, Cost Estimating, and Analysis	\$30,000
Task 6 – Prioritization of Alternatives	\$10,000
Task 7 - FEMA Letter of Map Revision	\$10,000
Task 8 – Refinement of Preferred Alternative and Documentation	\$34,000
City Administration and Management (10%)	\$18,000
Total Cost ^a	\$170,000

^a Cost rounded to two significant figures.



City of Edgewood Stormwater Capital Improvement Program

Project Summary Sheet

Name: Infiltration Pilot Project Design and Construction

2017 Project Number: NA

2009 Project Number: NA

1997 Project Number: EB-1 - EB-6

CIP List Priority: 9

Estimated Cost: \$1,900,000

PROBLEM DESCRIPTION

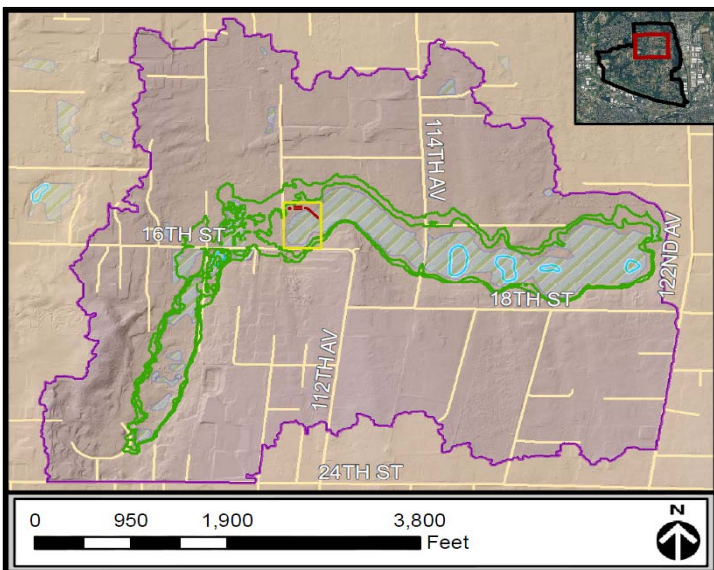
The City has six closed depression basins or potholes that flood during wet winters. One potential solution to the flooding from these potholes is to convey the stormwater to the uppermost aquifer through use of underground injection control (UIC) wells. The purpose of this project is to design and construct a stormwater treatment facility and associated UIC wellfield and to conduct testing and evaluate facility performance, but only if the associated feasibility assessment yields positive results. This pilot study would be conducted on the Edgewood Bowl pothole and include an assessment of the volume of water managed with the system and the impact of the system on pothole water elevations.

PROPOSED SOLUTION

A conveyance system will be constructed to convey water from the Edgewood Bowl pothole to a flow control structure that will direct water to one of two media filters containing specialized treatment media. Treated water would be discharged to the upper aquifer (as determined during the feasibility assessment project) through a UIC wellfield. This project would be done in coordination with Mt. View - Edgewood Water Company, the local water purveyor.

COST ESTIMATE ASSUMPTIONS

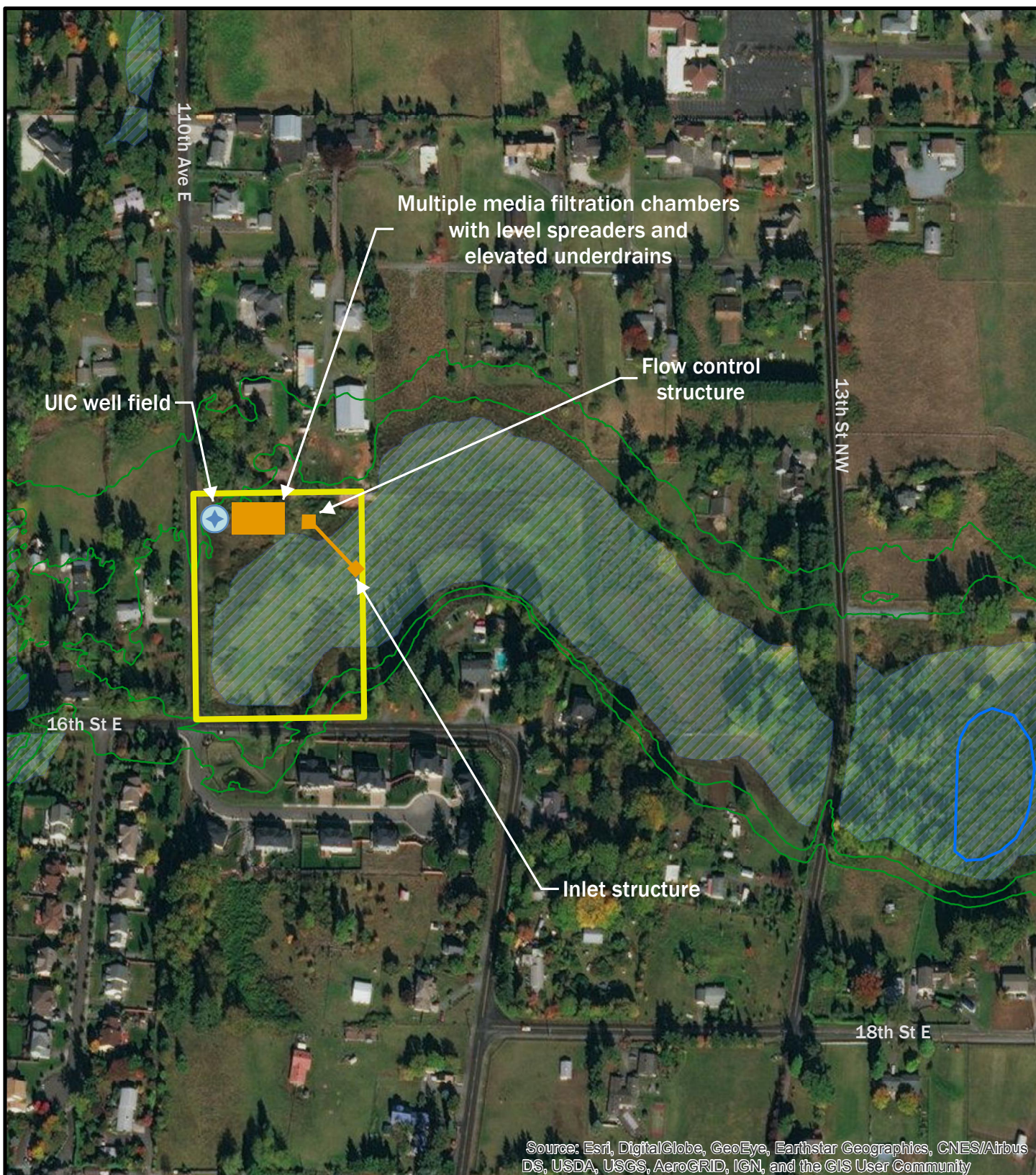
Cost estimates are based on using the 4 acre City-owned parcel at 16th Street E and 110th Avenue E. The cost includes construction of the conveyance system that includes piping and control structures, a treatment facility system that includes 2 media filters, a well field of 5 UIC wells, excavation, mitigation, and administration. Allowances and a contingency are included to allow for wetland mitigation or additional costs for inlet structures, pump stations, or alternate property purchases. Costs for city project management, design, geotechnical evaluation, permitting, and construction management are also included. The cost estimate does not include the cost for a long term water quality monitoring program to assess treatment performance, and hydrologic monitoring to track the volume of water treated and the effect on pothole water levels. It is assumed that monitoring would be conducted under a separate project.



Proposed pilot project location



Walker Pond flooding within Edgewood Bowl pothole

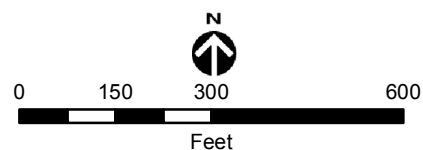


Legend

- Water bodies
- Pilot project structure
- City-owned parcel (4.0 acres)
- Edgewood Bowl flood elevations
- Wetlands
- Edgewood city limits



Edgewood Closed Depression UIC Pilot Project Concept



Engineering Construction Cost Estimate for "Conceptual Design and Order of Magnitude"

Project Name: Infiltration Pilot Project Design and Construction
 Project Number: 17-06504-000
 Client: City of Edgewood



QA Review

Completed/Updated By: M. Mullen & M. Fontaine
 Last Updated On: 10/23/2017
 Approved By: B. Busiek
 Approved On.: 10/24/2017

Item No.	Spec Section	Item Description	Qty	Unit	Unit Cost	Total Cost
	Div 1	General Requirements				
1		Mobilization	1	L.S.	8%	\$ 81,880
2		Erosion/Water Pollution Control	1	L.S.	5%	\$ 47,384
3		Utility Protection and Relocation	1	L.S.	1%	\$ 9,477
4		Project Temporary Traffic Control	1	L.S.	2%	\$ 18,954
	Div 2	Earthwork				
5		Structure Excavation Class B	830	C.Y.	\$ 35	\$ 29,037
6		Storm Sewer Backfill	657	C.Y.	\$ 15	\$ 9,852
7		Pond excavation	4,200	C.Y.	\$ 10	\$ 42,000
	Div 3	Aggregate Production and Acceptance				
8		Pipe Bedding	800	L.F.	\$ 15	\$ 12,000
	Div 7	Drainage Structures, Storm Sewers, Sanitary Sewers, Water Mains, and Conduits				
9		Inlet structure	1	Each	\$ 30,000	\$ 30,000
10		Control structure	1	Each	\$ 50,000	\$ 50,000
11		6" Underdrain Pipe	1,300	L.F.	\$ 15	\$ 19,500
12		12" Storm Sewer Pipe (PVC)	800	L.F.	\$ 20	\$ 16,000
13		UIC Wells	5	Each	\$ 30,000	\$ 150,000
14		Trench safety	5,600	S.F.	\$ 1	\$ 7,448
	Div 8	Miscellaneous Construction				
15		Dewatering	20	Day	\$ 1,805	\$ 36,100
16		Electrical Service	1	L.S.	\$ 10,000	\$ 10,000
17		Allowance for Inlet Structure Extension / Automation	1	L.S.	\$ 50,000	\$ 50,000
18		Allowance for Wetland Restoration	1	L.S.	\$ 100,000	\$ 100,000
19		Impermeable Liner 40 Mil LLDPE	4,200	S.Y.	\$ 16	\$ 67,200
20		Level spreader	480	L.F.	\$ 206	\$ 98,842
21		Filter media	1,600	C.Y.	\$ 137	\$ 219,707
		Construction Subtotal				\$ 1,105,380
		Tax	9.4%			\$ 103,906
		Contingency	30%			\$ 331,614
		Construction Total (with tax and Contingency; 2 sig figs)				\$ 1,500,000
		Allied Costs				
		City Project Administration / Management	5%			\$ 80,000
		Design Engineering	10%			\$ 150,000
		Geotechnical	3%			\$ 50,000
		Permitting	3%			\$ 50,000
		Construction Management	5%			\$ 80,000
		Project Total (Includes Allied Costs, Contingency, and Tax; 2 sig figs)				\$ 1,900,000



City of Edgewood Stormwater Capital Improvement Program

Project Summary Sheet

Name: Edgewood Drive East Drainage Improvements

2017 Project Number: NA

2009 Project Number: 23

1997 Project Number: SE-2

CIP List Priority: 15

Estimated Cost: \$860,000

PROBLEM DESCRIPTION

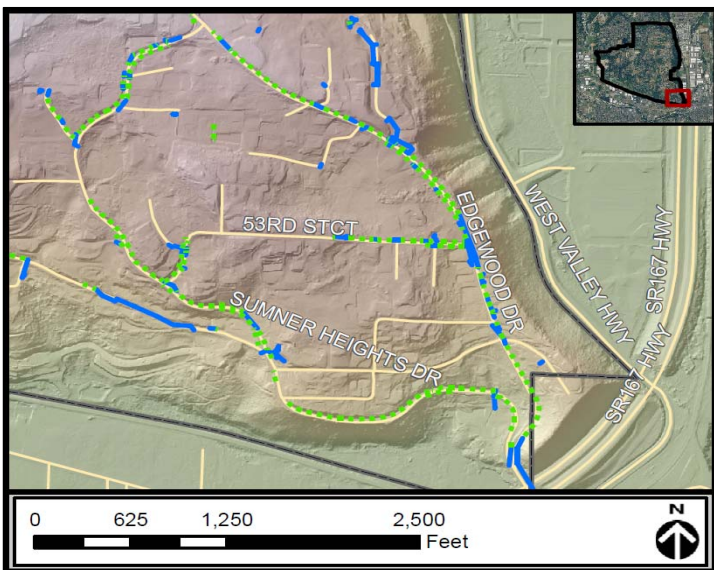
Edgewood Drive is a narrow roadway with substandard alignment complicated by its partial location on a bench within a steep slope. Inadequate roadway drainage has led to runoff flowing down the hill and off the roadway onto properties located on the west side of the road. Existing ditches are undersized and existing piped conveyance overtops in large storm events resulting in water on the roadway and property flooding. Ice also develops on the roadway during the winter months due to the poor drainage resulting in unsafe driving conditions.

PROPOSED SOLUTION

Construct conveyance improvements to alleviate drainage problems as an interim repair until complete road reconstruction can be completed. Improvements include ditch restoration, inclusion of flow restrictors in the conveyance, installation and replacement of driveway and intersection culverts, and installation of a thickened edge and catch basins opposite the open ditch. Existing conveyance in the receiving system must be evaluated for adequate capacity and energy dissipation.

COST ESTIMATE ASSUMPTIONS

The total project cost was calculated by escalating the 2009 CIP cost to account for inflation. The 2009 estimate includes installation of 15 catch basins, 1,380 LF of 8 to 12-inch diameter storm sewer, and 2,000 LF of thickened edge along the roadway. Additional costs include 2,000 LF of ditch restoration, adjusting existing catch basins, repairing the road, city administration and engineering, and a 30 percent project contingency.



Project location map



Edgewood Drive at 53rd Street E



City of Edgewood Stormwater Capital Improvement Program Project Summary Sheet

Name: Jovita Creek Regional Improvement Feasibility Study

2017 Project Number: SW-3

2009 Project Number: 6, 27, 28

1997 Project Number: JC-3, JC-4

CIP List Priority: 17

Estimated Cost: \$500,000

PROBLEM DESCRIPTION

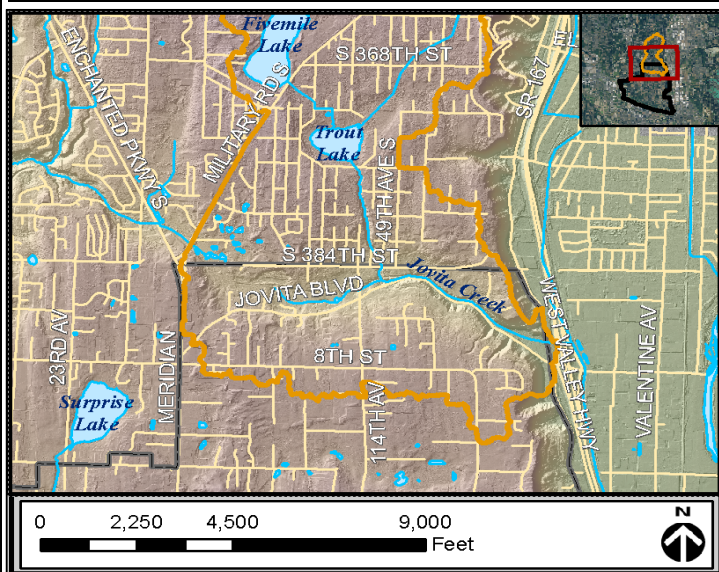
Where it flows through Edgewood, Jovita Creek is a narrow, steep stream corridor that leads to the valley floor with ravine side slopes that range from 10% to 70%. Increased urbanization and impervious area throughout the basin have led to increased flow rates in the creek compared to natural conditions, triggering landslides and severe erosion in the stream bed. Problems identified in the stream corridor include: road closures, debris clogged culverts, stream down cutting, marginal slope stability of the over steepened canyon walls, erosion caused by stormwater outfalls, and inadequate stream capacity. These problems require a regional approach because the basin spans four jurisdictions: King County, Pacific, Milton, and Edgewood.

PROPOSED SOLUTION

The purpose of this project is to develop a plan for the Jovita Creek basin that will prioritize short and long term actions to improve the overall health of the basin. The plan will include evaluation of flooding, slope stability, erosion, water quality, and fish and wildlife habitat problems in the basin under existing and future conditions and will address TMDL requirements. The plan will define and prioritize solutions and include planning level cost estimates for capital projects. The plan will also include maintenance and operations activities, and programmatic measures including education and outreach to correct, mitigate, or avoid these problems. This may require survey of key drainage system components, use of GIS tools, flow monitoring, water quality sampling, or hydrologic and hydraulic modeling. Potential water quality impacts and environmental regulations will also need to be factored into the analyses.

COST ESTIMATE ASSUMPTIONS

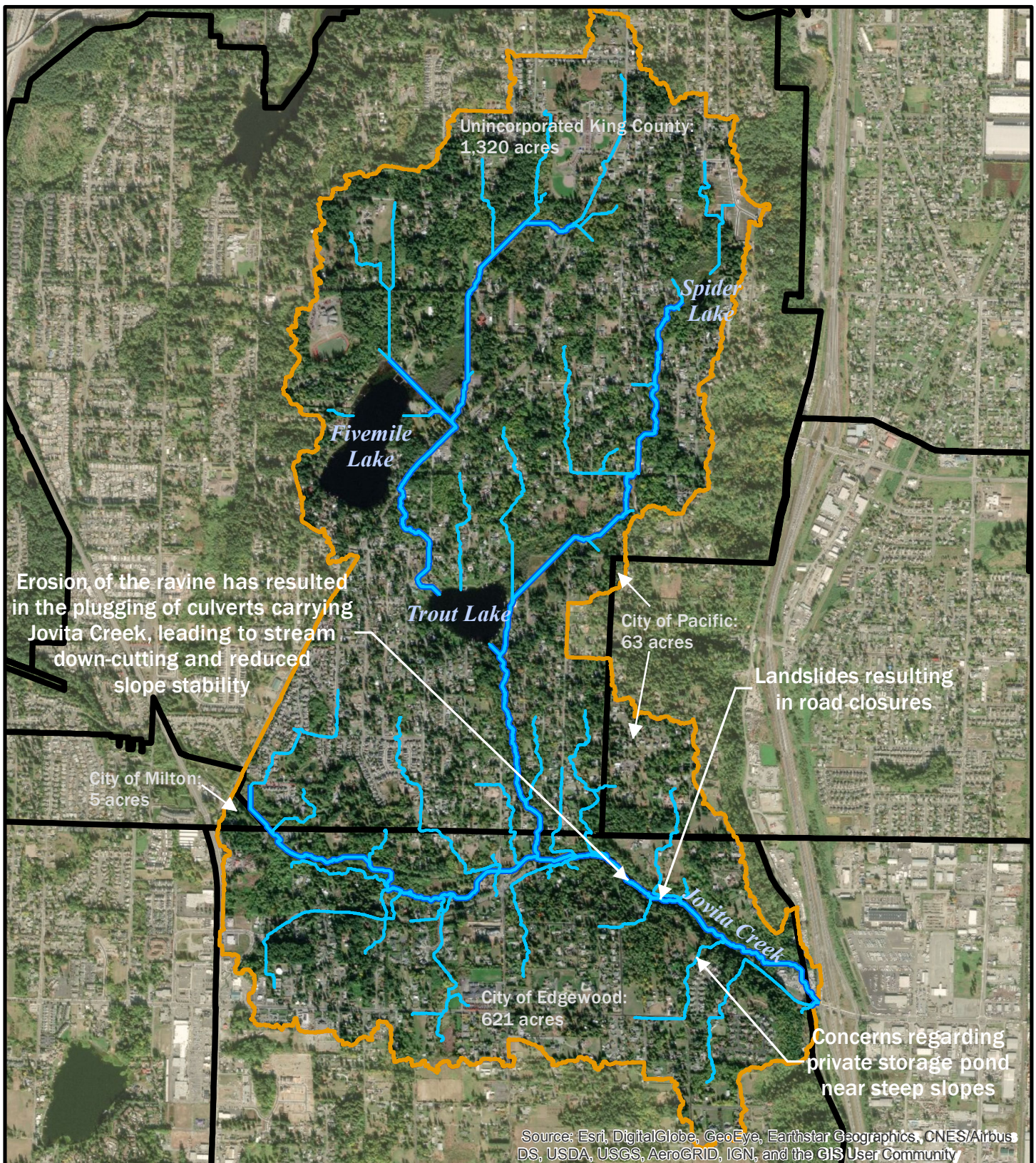
The cost estimate is based on consultant experience with similar interjurisdictional projects and includes public involvement, field assessment, modeling, development and prioritization of alternatives, and development of a plan.



Project location map

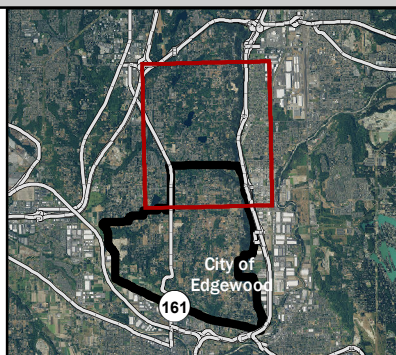


Stormwater along Jovita Boulevard

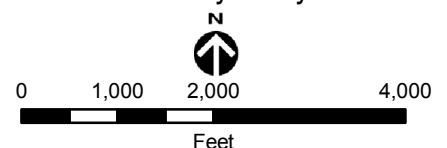


Legend

- Jovita Creek and tributary channels
- Jovita Creek watershed
- City and county boundaries



Jovita Creek Regional Improvement Feasibility Study



Cost Estimate for Jovita Creek Regional Feasibility Study.	
Tasks	Estimated Cost
Task 1 – Project Management and Coordination	\$75,000
Task 2 – Public and Stakeholder Outreach	\$25,000
Task 3 – Field Survey/Opportunity Assessment	\$25,000
Task 4 – Modeling of Existing and Future Conditions	\$65,000
Task 4 – Existing Conditions Assessment and Modeling Report	\$40,000
Task 5 – Scenario Development, Cost Estimating, and Analysis	\$60,000
Task 6 – Prioritization of Alternatives	\$40,000
Task 8 – Development of CIPs	\$45,000
Task 9 – Development of Regional Plan	\$50,000
City Administration and Management	\$75,000
Total Cost ^a	\$500,000

^a Cost rounded to two significant figures.

APPENDIX D

Subbasin Inventory Data for Edgewood

Subbasin Inventory Data for Edgewood																			
Basin Group		White River Basin			Jovita Creek Basin	Puyallup River Basin	Wapato Creek Basin	Simons Creek Basin		Hylebos Creek Basin			Pothole Basins						TOTAL
Subbasin		Northern Slopes	Central Slopes	Southern Slopes				Simons Creek	Tributary to Simons Creek	Surprise Lake Creek	Surprise Lake	Hylebos Creek	Edgewood Bowl Pothole	Lake Chalet Pothole	Pinedale Pond/ 114th Ave Pothole	108th Ave Pothole	122nd Ave Pothole	Surprise Lake Pothole	
Area within the city		274.3	75.2	194.0	622.4	444.6	576.6	529.2	261.3	474.7	62.3	4.7	656.0	136.0	384.3	225.9	347.7	73.8	5,343.0
Impervious Area		23.1	3.7	62.1	121.1	82.7	133.0	130.5	39.1	86.3	22.7	2.9	136.0	36.5	83.5	49.2	60.5	17.8	1,090.6
Zoning	BP	0.0	0.0	0.0	34.8	0.0	0.0	0.0	0.0	0.0	0.0	4.7	0.0	0.0	0.0	0.0	0.0	0.0	39.5
	C	4.2	0.0	0.0	33.6	0.0	0.0	0.0	0.0	0.0	42.9	0.0	0.0	0.0	0.0	0.0	0.0	23.0	103.6
	I	0.0	0.0	0.0	0.0	18.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.4
	MR-1	0.0	0.0	0.0	0.0	0.0	13.8	0.0	0.0	76.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	90.6
	MR-2	0.0	0.0	0.0	22.1	0.0	0.0	5.4	0.0	0.0	1.1	0.0	13.3	0.0	0.0	0.0	0.0	21.0	62.8
	MUR	0.0	0.0	0.0	0.0	0.0	12.7	15.6	27.7	76.7	0.0	0.0	0.0	24.5	0.0	0.0	0.0	0.0	157.1
	Public	0.0	0.0	18.6	42.9	2.0	8.9	29.8	9.8	15.0	0.6	0.0	49.2	14.5	5.7	0.8	10.3	0.3	208.2
	Public ROW	0.0	0.0	0.0	0.0	1.4	1.4	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8
	SF-2	270.1	75.2	35.5	423.9	69.5	24.6	0.0	0.7	0.0	0.0	0.0	428.3	0.6	350.4	114.9	278.3	0.0	2,072.0
	SF-3	0.0	0.0	139.9	65.2	353.5	515.1	366.4	223.2	278.2	15.0	0.0	165.1	91.3	28.2	110.2	59.1	21.4	2,431.8
	SF-5	0.0	0.0	0.0	0.0	0.0	0.0	42.8	0.0	21.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	64.6
	TC	0.0	0.0	0.0	0.0	0.0	0.0	69.3	0.0	6.2	1.8	0.0	0.1	5.2	0.0	0.0	0.0	8.1	90.7
Vulnerable ARA		3.7	1.0	0.5	7.4	13.2	181.1	37.7	56.6	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	303.5
WHPA		1.4	0.0	0.0	434.3	4.7	370.4	503.4	238.7	63.3	34.9	0.7	634.6	136.0	357.5	225.9	234.2	67.4	3,307.5
Flood Hazard Areas	City identified flood hazard areas	0.0	0.0	0.0	0.0	1.4	20.1	0.0	3.6	0.0	0.0	0.0	23.7	0.0	0.0	6.1	12.9	0.0	67.7
	FEMA floodway	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37.3	6.8	25.4	6.1	17.1	3.3	96.0
	City identified floodway	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37.3	6.8	25.4	6.1	17.1	3.3	96.0
	FEMA 100-year floodplain	0.0	0.0	0.0	12.6	0.0	55.7	24.3	14.5	13.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	120.7
	City identified 100-year floodplain	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.8	19.8	45.8	25.7	19.7	4.3	162.1
	Combined flood hazard	0.0	0.0	0.0	12.6	1.4	75.8	24.3	18.1	13.5	0.0	0.0	70.5	19.8	45.8	31.3	32.6	4.3	350.1
Steep slopes (>20%)		138.2	46.1	53.7	60.1	107.3	68.6	52.4	21.6	89.0	0.5	0.6	5.4	0.8	2.0	0.6	1.7	1.1	649.6
Steep slopes (>40%)		9.9	2.3	6.0	9.7	4.0	4.2	6.6	1.0	8.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.3
Stream Corridor		29.8	0.0	0.0	224.3	27.3	177.4	233.6	78.1	216.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	987.4
Wetland area		7.5	2.7	1.2	59.0	16.9	23.1	13.7	10.6	15.8	3.0	0.0	88.9	11.1	30.0	30.8	25.5	5.7	345.6

APPENDIX E

Stormwater Utility Financial Analysis

The contents of this appendix will be provided
at a later date.

City of Edgewood

Utility Rate Study: Surface Water Utility

Comparison of Rate Scenarios

Comparison of May 2018 and July 2018 CIP

Critical Projects	2018	2019	2020	2021	2022	2023	Total
CIP							
July 2018 CIP	\$ 260,000	\$ 1,135,000	\$ 675,000	\$ 985,000	\$ 275,000	\$ 125,000	\$ 3,455,000
May 2018 CIP	245,000	435,000	705,000	1,475,000	925,000	1,135,000	4,920,000
Rate Increases							
July 2018 CIP		40.00%	15.00%	2.50%	2.50%	2.50%	
May 2018 CIP		30.00%	15.00%	15.00%	2.50%	2.50%	

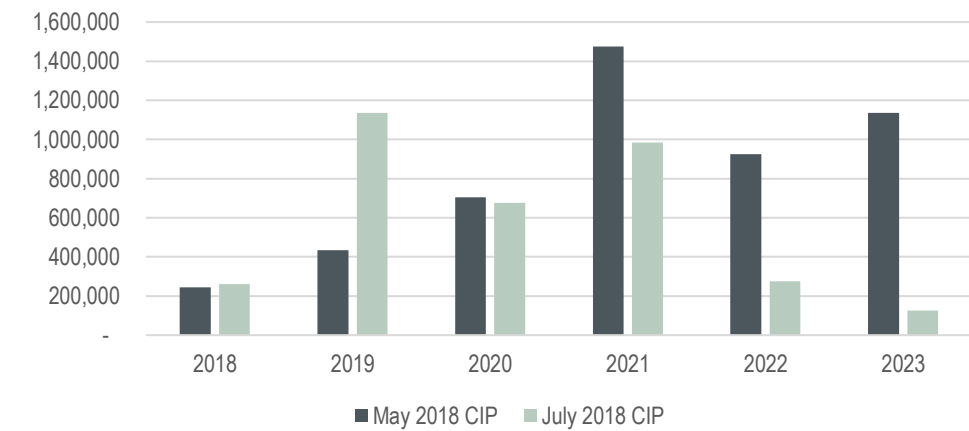
Critical + Infiltration Pilot	2018	2019	2020	2021	2022	2023	Total
CIP							
July 2018 CIP	\$ 260,000	\$ 1,135,000	\$ 775,000	\$ 1,735,000	\$ 1,325,000	\$ 125,000	\$ 5,355,000
May 2018 CIP							
Rate Increases							
July 2018 CIP	0.00%	40.00%	25.00%	2.50%	2.50%	2.50%	
May 2018 CIP							

All Projects	2018	2019	2020	2021	2022	2023	Total
CIP							
July 2018 CIP	\$ 260,000	\$ 1,185,000	\$ 1,525,000	\$ 2,545,000	\$ 2,225,000	\$ 1,655,000	\$ 9,395,000
May 2018 CIP	245,000	985,000	2,305,000	1,905,000	2,875,000	1,805,000	10,120,000
Rate Increases							
July 2018 CIP	0.00%	55.00%	15.00%	15.00%	2.50%	2.50%	
May 2018 CIP	0.00%	60.00%	15.00%	15.00%	2.50%	2.50%	

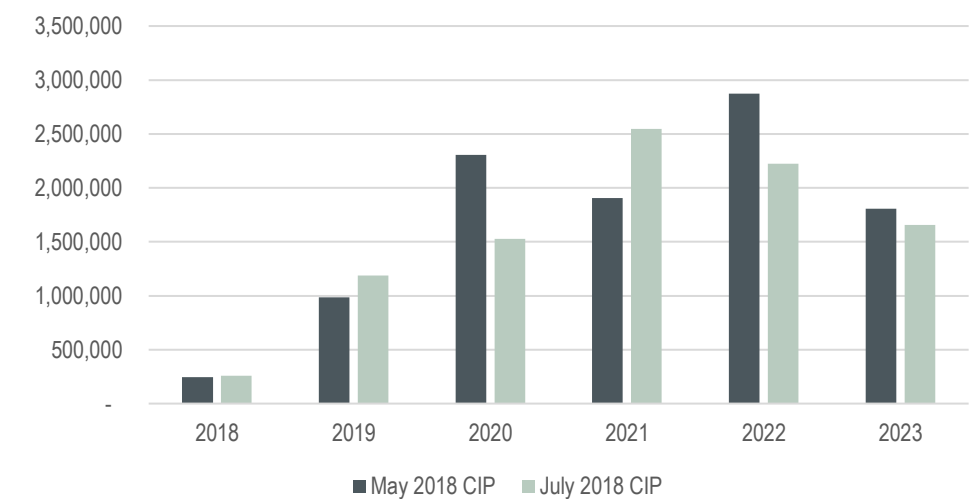
Summary of July 2018 Rate Scenarios

	2018	2019	2020	2021	2022	2023	Total
Scenario A: Critical Projects Only							
Annual Rate Increase	0.00%	40.00%	15.00%	2.50%	2.50%	2.50%	
Single-Family Monthly Bill	\$ 13.25	\$ 18.55	\$ 21.33	\$ 21.87	\$ 22.41	\$ 22.97	
Capital Spending (inflated)	\$ 267,800	\$ 1,204,122	\$ 737,591	\$ 1,108,626	\$ 318,800	\$ 149,257	\$ 3,786,195
New Debt	\$ -	\$ 1,800,000	\$ -	\$ 1,000,000	\$ -	\$ -	\$ 2,800,000
Scenario B: Critical Projects + Infiltration Pilot							
Annual Rate Increase	0.00%	40.00%	25.00%	2.50%	2.50%	2.50%	
Single-Family Monthly Bill	\$ 13.25	\$ 18.55	\$ 23.19	\$ 23.77	\$ 24.36	\$ 24.97	
Capital Spending (inflated)	\$ 267,800	\$ 1,204,122	\$ 846,863	\$ 1,952,758	\$ 1,536,038	\$ 149,257	\$ 5,956,837
New Debt	\$ -	\$ 1,800,000	\$ 1,000,000	\$ 2,200,000	\$ -	\$ -	\$ 5,000,000
Scenario C: All Projects							
Annual Rate Increase	0.00%	55.00%	15.00%	15.00%	2.50%	2.50%	
Single-Family Monthly Bill	\$ 13.25	\$ 20.54	\$ 23.62	\$ 27.16	\$ 27.84	\$ 28.54	
Capital Spending (inflated)	\$ 267,800	\$ 1,257,167	\$ 1,666,409	\$ 2,864,420	\$ 2,579,385	\$ 1,976,157	\$ 10,611,336
New Debt	\$ -	\$ 2,250,000	\$ -	\$ 3,700,000	\$ -	\$ 1,300,000	\$ 7,250,000

CIP Cost Schedule: Critical Projects



CIP Cost Schedule: All Projects





City Of Edgewood Council Agenda Summary Sheet

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SUBJECT: Code amendment pertaining to the standards and procedures for permitting, approval, collocation, removal, replacement, design, and maintenance of new and existing wireless communication facilities.		Agenda Item #: 2F	
		For Agenda of: August 7, 2018	
		Prepared by: Darren Groth	
ATTACHMENTS (list): ☒ Staff Report ☒ Draft Article 10 – Use Provisions ☒ Draft Article 15 – WCF Definitions ☒ Draft of City Ordinance			
Review of Materials:			
Mayor, Daryl Eidinger	☐	Expenditure Required:	\$0
Asst. City Administrator, Dave Gray	☐	Amount Budgeted:	\$0
City Attorney, Carol Morris	☐	Appropriation Required:	\$0
City Clerk, Rachel Pitzel	☐	Timeline: August 7, 2018: Study Session August 14, 2018: Public Hearing August 21, 2018: Study Session August 28, 2018: Adoption	
Community Development Director, Darren Groth	☒		
Public Works, Jeremy Metzler	☐	BARS:	
Fiscal Note/Consideration: N/A			
SUMMARY STATEMENT: The City recognized a need to update various provisions of its Edgewood Municipal Code (EMC) pertaining to wireless communication facilities (WCF). The current EMC Section 18.100.110 is not current and does not match the needs of the various communication companies wanting to provide wireless coverage in Edgewood. As a result, the proposal will repeal and replace the current EMC code with the attached Article 10 – Use Provisions and Article 15 – WCF Definitions.			
COUNCIL COMMITTEE REVIEW AND RECOMMENDATION: The Planning Commission recommended approval of the draft ordinance, as modified below. 1. Section 10.4.J – Permit Timing language updated for clarity; 2. Tables 1 and 2 – tower height increased allowances with a CUP; and 3. Tables 1 and 2 – footnote sentence language structure.			
RECOMMENDED ACTION: Receive a briefing, hold a discussion, and provide any direction to staff regarding the proposed code amendment.			

CITY OF EDGEWOOD STAFF REPORT

Discussion

On May 14, 2018, the Planning Commission opened a discussion item regarding cell tower siting in Edgewood. The conversation focused on the current code requirements for personal wireless service facilities (PWSFs). Section 18.100.110 of the Edgewood Municipal Code (EMC) addresses the issues of location and appearance associated with PWSFs. Currently, a PWSF may be located via a Conditional Use Permit in the following land use zones:

1. Commercial, MUR, Business Park, and Town Center; provided, that they are located within 300 feet of Meridian Avenue East.
2. Industrial, which are not required to be within 300 feet of Meridian Avenue East.
3. Public; provided, that they are located within 600 feet of Meridian Avenue East.

The limitation to within 300 or 600 feet of Meridian Avenue potentially limits the availability of tower siting that will comprehensively cover the city. As such, several representatives from various cellular companies approached the City staff to seek code modification that will be technologically sound and still meet the needs of the community. During the May 14 meeting, the Planning Commission discussed various options to move forward with possible code amendments. The Commission allowed staff to meet with stakeholders in order to draft amendments that keep up with national technology standards and address the following items of local importance:

1. Aesthetics;
2. Safety, of the facilities and emissions;
3. Accessibility;
4. Separation distance setbacks; and
5. Co-location requirements.

Staff met with representatives of multiple cellular companies and drafted a model code. The initial model code has been revised in accordance with applicable state law and EMC processing provisions. In addition, several sections of the model code were rewritten to match the specific language contained in the model ordinance presented on the National League of Cities website. The National League of Cities model code was intended to serve as the initial basis for the first model code presented to the Planning Commission during its June 11, 2018 meeting. The revised draft code was published online for the public hearing and shared with the industry representatives.

The Planning Commission held a public hearing on the draft code on July 9, 2018. Chair Lowry opened the public hearing at 6:07 p.m. Community Development Director Darren Groth briefed the Commission on the requested code amendment. Kim Allen, Wireless Policy Group, was present and voiced support for the code change request, but made two language amendment recommendations. The first recommendation was to clarify the language pertaining to permit timing in Section 10.4.J. The second recommendation was to allow increased tower heights if the applicant seeks a Conditional Use Permit. In addition to the two recommended changes from Ms. Allen, Commissioner Guillory also suggested a similar format for all table footnotes. The Planning Commission voted 4-0 to recommend approval of the draft code with all three text modifications. The draft presented to the City Council includes all of the updates approved by the Planning Commission.

Article 10

Use Provisions

Div. 10.4 Wireless Communications Facilities.

A. Purpose. The purpose of this Division is:

1. To protect the community's natural beauty, visual quality and safety while facilitating the reasonable and balanced provision of wireless communication services. More specifically, it is the City's goal to minimize the visual impact of WCFs on the community, particularly in and near residential zones;
2. To promote and protect the public health, safety, and welfare, preserve the aesthetic character of the Edgewood community, and to reasonably regulate the development and operation of WCFs within the City to the extent permitted under State and federal law;
3. To minimize the impact of WCFs by establishing standards for siting design and screening;
4. To encourage the collocation of antennas on existing structures, thereby minimizing new visual impacts and reducing the potential need for new towers that are built in or near residential zones by encouraging that WCFs first be located on buildings, existing towers or utility poles in public rights-of-way;
5. To protect residential zones from excessive development of WCFs;
6. To ensure that towers in or near residential zones are only sited when alternative facility locations are not feasible;
7. To preserve the quality of living in residential areas which are in close proximity to WCFs;
8. To preserve the opportunity for continued and growing service from the wireless industry;
9. To preserve neighborhood harmony and scenic viewsheds and corridors;
10. To accommodate the growing need and demand for wireless communication services;
11. To establish clear guidelines and standards and an orderly process for expedited permit application review intended to facilitate the deployment of wireless transmission equipment, to provide advanced communication services to the City, its residents, businesses and community at large;
12. To ensure City zoning regulations are applied consistently with federal telecommunications laws, rules, regulations and controlling court decisions;
13. To encourage the use of Distributed Antenna Systems (DAS) and other small cell systems

that use components that are a small fraction of the size of macrocell deployments, and can be installed with little or no impact on utility support structures, buildings, and other existing structures; and

14. To provide regulations which are specifically not intended to, and shall not be interpreted or applied to, (1) prohibit or effectively prohibit the provision of personal wireless services, (2) unreasonably discriminate among functionally equivalent service providers, or (3) regulate WCFs and wireless transmission equipment on the basis of the environmental effects of radio frequency emissions to the extent that such emissions comply with the standards established by the Federal Communications Commission.

15. To implement Section 6409(a) of the Middle Class Tax Relief and Job Creation Act of 2012 ("Spectrum Act"), as interpreted by the Federal Communications Commission's ("FCC" or "Commission") Acceleration of Broadband Deployment Report & Order, which requires a state or local government to approve any Eligible Facilities Request for a modification of an existing tower or base station that does not result in a substantial change to the physical dimensions of such tower or base station.

B. Exemptions. The following are exempt from the provisions of this Div. 10.4 and shall be permitted in all zones:

1. Industrial processing equipment and scientific or medical equipment using frequencies regulated by the Federal Communications Commission (FCC).
2. Antennas and related equipment, no more than three feet in height, that are being stored, shipped, or displayed for sale.
3. Facilities used for purposes of public safety, such as, but not limited to, police, hospitals, and the regional 911 system.
4. Wireless radio towers, equipment, facilities, and associated appurtenances utilized for temporary emergency communications in the event of a disaster.
5. Licensed amateur (ham) radio stations.
6. Satellite dish antennas less than two meters in diameter, including direct to home satellite services, when used as a secondary use of the property.
7. Personal wireless service facilities, which existed on or prior to February 14, 1998; except that this exemption does not apply to modifications of existing facilities.
8. Routine maintenance or repair of a personal wireless service facility and related equipment (excluding structural work or changes in height or dimensions of antennas, towers, or buildings); provided, that compliance with the standards of this section are maintained.
9. Subject to compliance with all other applicable standards of this code, a building permit application need not be filed for emergency repair or maintenance of a personal wireless service

facility until 30 days after the completion of such emergency activity.

10. Automated meter reading systems are permitted on utility poles provided any equipment mounted on the poles is less than 14 inches by 12 inches by 12 inches for the structure and associated antennas are less than 18 inches from the structure. This exemption shall be allowed in all zoning areas; however, structures are allowed only on power poles for the intended use of the power poles owner and may not be leased to other users.

C. New Wireless Communication Antenna Arrays -- permitted in all zones with administrative use permit as long as they meet the following requirements:

1. Concealment and design requirements (as set forth in Div. 10.4.(F)(5) and (6); and

2. Attached to or inside of an existing or replacement nonresidential structure with a maximum additional height of no more than 15 feet above the existing structure, or the minimum necessary to meet the required safety clearances or pole owner's requirements.

D. Distributed Antenna Systems and Small Cells.

1. Siting.

a. Distributed Antenna Systems (DAS) and Small Cells are permitted in all zones as long as they meet the following requirements:

(1) DAS and Small Cells in public right-of-way subject to the City's approval of a master use permit/franchise agreement under EMC Title 12.

(2) DAS and Small Cells require an administrative use permit and a building permit if their installation requires construction of a new utility support structure or building;

(3) DAS and Small Cells do not require an administrative use permit or building permit if the height of a replacement structure, including antennas, is no more than the greater of: (1) fifteen feet taller than the existing utility support structure; or (2) the minimum height necessary to provide the required safety clearances from transmission or distribution lines and pole owner requirements.

b. Multiple Site DAS and Small Cells are permitted, per the following requirements:

(1) An administrative use permit for multiple distributed antennas that are part of a larger overall DAS network;

(2) An administrative use permit for multiple small cells placed to provide wireless coverage in a contiguous area;

(3) For locations in the public right-of-way, a single master use permit/franchise agreement (Title 12 EMC) may be used for multiple node locations in DAS and/or small cell networks throughout the City.

2. Standards -- Small Cell Equipment.

a. All related equipment, including but not limited to ancillary equipment, radios, cables, associated shrouding, microwaves, and conduit which are mounted on utility support structures shall not be mounted more than six (6) inches from the surface of the support structure, unless a further distance is technically required, and is confirmed in writing by the support structure owner.

b. Equipment for small cell facilities must be attached to the utility support structure, unless otherwise permitted to be ground mounted. The equipment must be placed in the smallest enclosure possible for the intended purpose. The equipment enclosure may not exceed seventeen (17) cubic feet. Multiple equipment enclosures may be acceptable if designed to more closely integrate with the support structure design and does not cumulatively exceed seventeen (17) cubic feet. The applicant shall place the equipment enclosure behind any banners or road signs that may be on the support structure, if such banners or road signs are allowed by the pole owner and provided by the City.

c. An applicant who desires to enclose its antennas and equipment within a unified enclosure may do so, provided that such unified enclosure does not exceed four (4) cubic feet. To the extent possible the unified enclosure shall be placed so as to appear as an integrated part of the utility support structure or behind banners or signs. The unified enclosure may not be placed more than six (6) inches from the surface of the support structure, unless a further distance is technically required and confirmed in writing by the support structure owner.

d. Small cell facilities mounted on cables strung between existing utility poles shall conform to all of the following standards:

- (1) Each strand mounted facility shall not exceed (3) cubic feet in volume;
- (2) Only one strand mounted facility is permitted per cable between any two existing poles;
- (3) The strand mounted devices shall be placed as close as possible to the nearest utility pole, in no event more than six (6) feet from the pole unless a greater distance is technically necessary or required by the pole owner for safety clearance;
- (4) No strand mounted device shall be located in or above the portion of the roadway open to vehicular traffic;
- (5) Ground mounted equipment to accommodate such strand mounted facilities is not permitted, except when placed in pre-existing equipment cabinets;
- (6) Pole mounted equipment for strand mounted facilities shall meet the requirements ~~of~~ for pole mounted small cells; and
- (7) Such strand mounted devices must be installed to cause the least visual impact and with the minimum exterior cabling or wires (other than the original strand) necessary to meet the technological needs of the facility.

E. Standards -- Towers.

1. Prohibition. Only monopole towers are permitted in the City. Lattice towers and guyed towers are prohibited.

2. Siting. An administrative use permit is required to site a new tower in accordance with the criteria contained in Table 1 and Table 2. In addition, the location shall be subject to any additional siting priorities set forth in this chapter.

Table 1 New Wireless Communication Tower Criteria				
Zone Category	Located in Public Right-of-way (ROW)	Maximum Tower Height [2]	Stealth Design	Setback from Property Lines (does not apply within ROW)
C, MUR, TC, Public [1]	Yes	60'	See Footnote 1	N/A
	No	60'	See Footnote 1	20'
BP, I [1]	(allowed in ROW only if less than or equal to 70')	100'	See Footnote 1	20'

[1] Stealth design is required if an applicant constructs a tower in or within 50 to 150 feet of a residential zone.

[2] Tower heights of up to 120 feet can be requested through a Conditional Use Permit (CUP), where compatibility can be fully addressed.

Table 2 New Wireless Communication Tower Criteria			
Zone Category	Maximum Tower Height [2]	Stealth Design	Setback from Property Lines (does not apply within ROW)
SF, MR [3]	60'	Required	20'
C, MUR, TC, Public [3]	70'[4]	Optional [3]	20'

[3] Stealth design is required if an applicant constructs a tower in or within 50 feet of a residential zone.

[4] An additional 20 feet in height in these zones is allowed if applicant uses stealth design.

3. Tower Sharing and Collocation. New WCF facilities must, to the maximum extent feasible, collocate on existing towers or other structures of a similar height to avoid construction of new towers,

unless precluded by zoning constraints such as height, structural limitations, inability to obtain authorization by the owner of an alternative location, or where an alternative location will not meet the service coverage objectives of the applicant. Applications for a new tower must address all existing towers or structures of a similar height within 1/2 mile of the proposed site as follows: (a) by providing evidence that a request was made to locate on the existing tower or other structure, with no success; or (b) by showing that locating on the existing tower or other structure is infeasible.

4. Preferred Tower Locations. In addition to the development standards in this chapter, an applicant for a tower must submit documentation to demonstrate that there is a need for a new tower if is to be located in a residential zone or within one hundred fifty (150) feet of an existing residential lot. An evaluation of the operational needs of the wireless communications provider, alternative sites, alternative existing facilities upon which the proposed antenna array might be located, and collocation opportunities on existing support towers within one-half mile of the proposed site shall be provided. Evidence shall demonstrate that no practical alternative is reasonably available to the applicant.

In addition, all new towers proposed to be located in a residential zone or within 150 feet of a residential zone are permitted only after application of the following siting priorities, ordered from most-preferred (a) to least-preferred (f);

- a. City-owned or operated property and facilities, that are not in residential zones or located within 150 feet of residential zones;
- b. Industrial zones and business park zones (I & BP);
- c. Nonresidential (not SF or MR) zones;
- d. City-owned or operated property and facilities in any zone;
- e. Commercial, mixed use residential, town center & public zones (C, MUR, TC & Public);
- f. Residential zones (SF, MR).

The applicant for a tower located in a residential zone or within 150 feet of a residential zone shall address these preferences in an alternative sites analysis provided with the complete application.

5. Compliance with Code. The proposed tower shall satisfy all of the provisions and requirements of this Div. 10.4.

6. Public Notice. In addition to the notice requirements of EMC Chapter 18.40 and Section 18.50.040 for a conditional use permit, tower proposals in residential zones and within 150 feet of a residential zone shall include the following public notice:

- a. A black and white architectural elevation and color photo simulation rendering of the proposed WCF; and
- b. The sign required by EMC 18.40.180 shall include that same architectural elevation and color photo simulation combination selected by the City that depicts the visual impact of the WCF.

F. General Development Standards Applicable to WCF's. The following criteria shall be applied in approving, approving with conditions or denying a permit for a WCF. Unless otherwise provided in this chapter, WCF construction shall be consistent with the development standards of the zoning district in which it is located.

1. Height. Refer to Tables 1 and -2.

2. Setback Requirements.

a. Refer to Tables 1 and 2 for towers.

b. All equipment shelters, cabinets or other on-the-ground ancillary equipment shall be buried or meet the setback requirement of the zone in which located. Notwithstanding the setbacks provided for in Tables 1 and 2, when a residence is located on an adjacent parcel, the minimum side setback from the lot line for a new tower must be equal to the height of the proposed tower, unless:

1. The tower is constructed with breakpoint design technology. If the tower has been constructed using breakpoint design technology, the minimum setback distance shall be equal to 110 percent (110%) of the distance from the top of the structure to the breakpoint level of the structure, or the applicable zone's minimum side setback requirements, whichever is greater. (For example, on a 100-foot tall monopole with a breakpoint at eighty [80] feet, the minimum setback distance would be twenty-two [22] feet [110 percent of twenty (20) feet, the distance from the top of the monopole to the breakpoint] or the minimum side yard setback requirements for that zone, whichever is greater.) Provided, that if an applicant proposes to use breakpoint design technology to reduce the required setback from a residence, the issuance of building permits for the tower shall be conditioned upon approval of the tower design by a structural engineer.

2. Landscaping. All landscaping shall be installed and maintained in accordance with this chapter. Existing on-site vegetation shall be preserved to the greatest extent

reasonably possible and disturbance of the existing topography shall be minimized. The Director may grant a waiver from the required landscaping based on findings that a different requirement would better serve the public interest.

3. Tower bases, when fenced (compounds), or large equipment shelters (greater than three feet by three feet by three feet), shall be landscaped. Tower bases shall be screened by fencing and landscaping, which will encompass a five-foot radius around the fenced area.

4. If fencing is installed, it shall consist of decorative masonry or wood fencing.

5. Visual Impact. All WCFs in residential zones and within 150 feet of residential zones, including equipment enclosures, shall be sited and designed to minimize adverse visual impacts on surrounding properties and the traveling public to the greatest extent reasonably possible, consistent with the proper functioning of the WCF. Such WCFs and equipment enclosures shall be integrated through location and design to blend in with the existing characteristics of the site. Such WCFs shall also be designed to either resemble the surrounding landscape and other natural features where located in proximity to natural surroundings, or be compatible with the urban, built environment, through matching and complimentary existing structures and specific design considerations such as architectural designs, height, scale, color and texture, and/or be consistent with other uses and improvements permitted in the relevant zone.

6. Use of Stealth Design/Technology. Stealth design is required in residential zones and to the extent shown in Tables 1 and -2. Stealth and concealment techniques must be appropriate given the proposed location, design, visual environment, and nearby uses, structures, and natural features. Stealth design shall be designed and constructed to substantially conform to surrounding building designs or natural settings, so as to be visually unobtrusive. Stealth design that relies on screening WCFs in order to reduce visual impact must screen all substantial portions of the facility from view. Stealth and concealment techniques do not include incorporating faux-tree designs of a kind that are not native to the Pacific Northwest.

7. Lighting. For new towers, only such lighting as is necessary to satisfy FAA requirements is permitted. All FAA-required lighting shall use lights that are designed to minimize downward illumination. Security lighting for the equipment shelters or cabinets and other on-the-ground ancillary equipment is also permitted as long as it is down shielded to keep light within the boundaries of the site. Motion detectors for security lighting are encouraged in residential zones or adjacent to residences.

8. Noise. At no time shall transmission equipment or any other associated equipment (including, but not limited to, heating and air conditioning units) at any wireless communication facility emit noise that exceeds the applicable limit(s) established in EMC 18.90.140(E).

9. Signage. No facilities may bear any signage or advertisement(s) other than signage

required by law or expressly permitted or required by the City.

10. Code compliance. All facilities shall at all times comply with all applicable federal, state and local building codes, electrical codes, fire codes and any other code related to public health and safety.

11. Building-mounted WCFs.

a. In residential zones, all transmission equipment shall be concealed within existing architectural features to the maximum extent feasible. Any new architectural features proposed to conceal the transmission equipment shall be designed to mimic the existing underlying structure, shall be proportional to the existing underlying structure or conform to the underlying use and shall use materials in similar quality, finish, color and texture as the existing underlying structure.

b. In residential zones, all roof-mounted transmission equipment shall be set back from all roof edges to limit visibility from the right-of-way the maximum extent feasible.

c. In all other zones, antenna arrays and supporting transmission equipment shall be installed so as to camouflage, disguise, or conceal them to make them closely compatible with and blend into the setting or host structure.

12. WCFs in the public rights-of-way.

a. *Preferred locations.* Facilities shall be located as far from residential uses as feasible, and on main corridors and arterials to the extent feasible. Facilities in the rights-of-way shall maintain at least a two hundred (200) foot separation from other wireless facilities (except with respect to DAS or Small Cells), except when collocated or on opposite sides of the same street.

b. *Pole-mounted or tower-mounted equipment.* All pole-mounted and tower-mounted transmission equipment shall be mounted as close as possible to the pole or tower so as to reduce the overall visual profile to the maximum extent feasible while still maintaining required safety clearances. All pole-mounted and tower-mounted transmission equipment shall be painted with flat, non-reflective colors that blend with the visual environment.

c. *Exception from Setback Requirements.* Setbacks do not apply to facilities in the right-of-way, as shown in Tables 1 and -2.

13. Accessory Equipment. In residential zones, all equipment shall be located or placed in an existing building, underground, or in an equipment shelter or cabinet that is (a) designed to blend in with existing surroundings, using architecturally compatible construction and colors; and (b) located so as to be unobtrusive as possible consistent with the proper functioning of the WCF.

14. Spacing of Towers. Towers shall maintain a minimum spacing of one-half mile, unless it can be demonstrated that physical limitations (such as topography, terrain, tree cover or

location of buildings) in the immediate service area prohibit adequate service by the existing facilities or that collocation is not feasible.

15. Entire Lot Controls. For purposes of determining whether the installation of a WCF complies with development standards, such as, but not limited to, setback and lot coverage requirements, the dimensions of the entire lot shall control, even though a WCF is located on a leased parcel within that lot.

16. Back-up Power Sources. The City encourages proposed WCFs to include back-up power sources, such as batteries or generators, to maintain wireless service in the event of an emergency, such as a natural disaster. So long as the WCF otherwise complies with this chapter, a WCF using such back-up power during an emergency will be presumed to neither be detrimental to the public health, safety, and general welfare, nor injurious to, or adversely affect, the uses, property, or improvements adjacent to and in the vicinity of the site upon which the proposed use is proposed to be located.

G. Final Inspection.

1. A Certificate of Occupancy will only be granted upon satisfactory evidence that the WCF was installed in substantial compliance with the approved plans and photo simulations.
2. Failure to Comply. If it is found that the WCF installation does not substantially comply with the approved plans and photo simulations, the applicant immediately shall make any and all such changes required to bring the WCF installation into compliance.

H. Maintenance.

1. All wireless communication facilities must comply with all standards and regulations of the FCC and any other State or federal government agency with the authority to regulate wireless communication facilities.
2. The site and the wireless communication facilities, including all landscaping, fencing and related transmission equipment must be maintained at all times in a neat and clean manner and in accordance with all approved plans.
3. All graffiti on wireless communication facilities must be removed at the sole expense of the permittee after notification by the City to the owner, operator, or both of the WCF.
4. If any FCC, state or other governmental license or any other governmental approval to provide communication services is ever revoked as to any site permitted or authorized by the City, the permittee must inform the City of the revocation within thirty (30) days of receiving notice of such revocation.

I. Discontinuation of Use.

1. Any WCF that is no longer needed and its use is discontinued shall be reported immediately by the service provider to the Community Development Director. Discontinued facilities shall be completely removed within six months and the site restored to its pre-existing condition.

2. There shall also be a rebuttable presumption that any WCF that is regulated by this chapter and that is not operated for a period of six (6) months shall be considered abandoned. This presumption may be rebutted by a showing that such WCF is an auxiliary back-up or emergency utility or device not subject to regular use or that the WCF is otherwise not abandoned. For those WCFs deemed abandoned, all equipment, including, but not limited to, antennas, poles, towers, and equipment shelters associated with the WCF shall be removed within six (6) months of the cessation of operation. Irrespective of any agreement among them to the contrary, the owner or operator of such unused facility, or the owner of a building or land upon which the WCF is located, shall be jointly and severally responsible for the removal of abandoned WCFs. If the WCF is not thereafter removed within ninety (90) days of written notice from the City, the City may remove the WCF at the owner of the property's expense or at the owner of the WCF's expense, including all costs and attorneys' fees. If there are two or more wireless communications providers collocated on a single support structure, this provision shall not become effective until all providers cease using the WCF for a continuous period of six (6) months.

J. Limits on Issued Permits. Approved conditional and administrative permits for PWSFs shall be restricted by the following permit limitations.

1. An approved permit shall be valid for one (1) year from the date of the City's approval, with an opportunity for a six (6) month extension. If not issued within the validity timeframe, i.e., within 12 or 18 months, the permit shall become null and void.
2. The terms and conditions of an issued, but unused permit, for a PWSF shall expire five (5) years after the effective date of the permit approval.

K. Costs Associated with Review of Applications.

1. In addition to the application fee, the applicant shall reimburse the city for costs of professional engineers and other consultants hired by the city to review and inspect the applicant's proposal. These professional services may include but are not limited to: engineering, technical reviews, legal, planning, hearing examiner, environmental review, critical areas review, financial, accounting, soils, mechanical and structural engineering.

2. The technical expert review may include, but is not limited to (a) the accuracy and completeness of the items submitted with the application; (b) the applicability of analysis and techniques and methodologies proposed by the applicant; (c) the validity of conclusions reached by the applicant; and (d) whether the proposed WCF complies with the applicable approval criteria set forth in this chapter. The selection of the third-party expert may be by mutual

agreement between the provider and the city, or at the discretion of the city, with a provision for the provider and interested parties to comment on the proposed expert and review his or her qualifications. The applicant shall pay the cost for any independent consultant fees, along with applicable overhead recovery, through a deposit, estimated by the City, paid within ten (10) days of the City's request. When the City requests such payment, the application shall be deemed incomplete for purposes of application processing timelines. In the event that such costs and fees do not exceed the deposit amount, the City shall refund any unused portion within thirty (30) days after the final permit is released or, if no final permit is released, within thirty (30) days after the City receives a written request from the applicant. If the costs and fees exceed the deposit amount, then the applicant shall pay the difference to the City before the permit is issued.

L. Eligible Facilities Requests.

1. Procedure. This Div. 10.4(L) describes the sole and exclusive procedure for review and approval of a proposed facilities modification which the applicant asserts is subject to review under Section 6409 of the Spectrum Acct. In the event that any part of an application for a project permit approval includes a proposed facilities modification, the proposed facilities modification portion of the application shall be reviewed under this Div. 10.4(L).

2. Non-conforming structures. This Div. 10.4(L) shall not apply to a proposed facility modification to an eligible support structure that is not a legally conforming, or legally nonconforming structure at the time the completed eligible facilities modification application is filed with the City.

3. Replacement. This Div. 10.4(L) shall not apply to a proposed facility modification to an eligible support structure that will involve replacement of the tower or base station.

4. SEPA Review. Unless otherwise provided by law or regulation, decisions pertaining to eligible facilities requests are exempt from the requirements of RCW 43.21C.030(2)(c).

5. Application. An application for an Eligible Facilities Modification and supplemental submittals is received by the City upon the date such application is filed with the City. In order to be complete, the application must include all of the information and materials required in Article 16 of this Code.

6. Determination of Completeness. The City shall, within 21 days after receipt of the application, review the application under the procedures set forth in Subsection F below.

7. Timeframe for Review -- Approval/Denial.

a. Within 60 days of the date on which an applicant submits an application seeking approval for an Eligible Facilities Request, the City shall either approve the application (unless the application is tolled as set forth in Subsection F below), or determine that the application is not covered by an Eligible Facilities Request.

b. An Eligible Facilities application shall be approved, and an Eligible Facilities Permit issued, upon determination by the City that the proposed facilities modification is subject to this Section and that it does not substantially change the physical dimensions of an Eligible Support Structure. An Eligible Facilities application shall be denied upon written determination by the City that the proposed

facilities modification is not subject to this Section or will substantially change the physical dimensions of an Eligible Support Structure. A proposed facilities modification will substantially change the physical dimensions of an eligible support structure if it meets any of the substantial change criteria in Article 15 (Definitions).

c. An Eligible Facilities Modification Permit issued pursuant to this Div. 10.4.(L), and any application that has been deemed approved, shall be and is conditioned upon compliance with any generally applicable building, structural, electrical, and health/safety codes.

8. Tolling of Timeframe for Review. The application review period begins to run when the application is received, and may be tolled when the City determines that the application is incomplete and provides notice of an incomplete application; or by mutual agreement between the City and the applicant.

1. To toll the timeframe for an incomplete application, the City must provide written notice to the applicant within 30 days of receipt of the application, specifically delineating all missing documents or information required in the application.

2. The timeframe for review begins running again when the applicant makes a supplemental submission in response to the City's notice of incomplete application.

3. Following a supplemental submission by the applicant, the City will notify the applicant within 10 days that the supplemental submission did not provide the information identified in the original notice delineating missing information. The timeframe is tolled in the case of second or subsequent notices pursuant to the procedures identified in this Subsection F. Second or subsequent notices of incompleteness may not specify missing documents or information that were not delineated in the original notice of incomplete application.

9. Failure to Act. In the event that the City fails to approve or deny an Eligible Facilities Request within the timeframe for review in Div. 10.4(L)(8) above (accounting for any tolling), the request shall be deemed approved. The deemed approval does not become effective until the applicant notifies the City in writing after the review period has expired (accounting for any tolling) that the application has been deemed approved.

Article 15

Definitions -- Wireless Communications Facilities

A.

Abandon. When an owner of a Support Structure intends to permanently and completely cease all business activity associated therewith.

Accessory Equipment. Any equipment serving or being used in conjunction with a Telecommunications Facility or Support Structure. This equipment includes, but is not limited to, utility or transmission equipment, power supplies, generators, batteries, cables, equipment buildings, cabinets and storage sheds, shelters or other structures.

Adequate public facilities. Facilities which have the capacity to serve development without decreasing levels of service below minimums established by the City in the Comprehensive Plan.

Amateur Radio Tower. A facility used for personal, non-commercial radio licensed by the Federal Communications Commission.

Antenna. Any system of electromagnetically tuned wires, poles, rods, reflecting discs or similar devices used to transmit or receive electromagnetic waves between terrestrial and/or orbital based points, and includes, but is not limited to:

- a. Whip antenna(s): An omni-directional antenna which transmits and receives radio frequency signals in a 360-degree radial pattern, typically four inches or less in diameter.
- b. Panel antenna(s): A directional antenna which transmits and receives radio frequency signals in a specific directional pattern of up to 120 degrees, typically thin and rectangular in shape.
- c. Tubular antenna(s): A hollow tube typically twelve (12) inches in diameter containing either omni-directional or directional antennas, depending on the specific site requirement. Often used as a means to mitigate the appearance of antennas on top of light standards and power poles.
- d. Parabolic (or dish) antenna(s): A bowl-shaped device for the reception and/or transmission of communications signals in a narrow and specific direction.
- e. Ancillary antenna(s): An antenna that is less than twelve (12) inches in its largest dimension and that is not directly used to provide personal wireless communications services. An example would be a global positioning satellite (GPS) antenna.

Antenna Array. A single or group of antenna elements and associated mounting hardware, transmission lines, or other appurtenances which share a common attachment device such as a mounting frame or mounting support structure for the sole purpose of transmitting or receiving electromagnetic waves.

B.

Base station. The structure or equipment at a fixed location that enables wireless communications licensed or authorized by the FCC, between user equipment and a communications network. The term does not encompass a tower as defined in this Code or any equipment associated with a tower.

- a. The term Base Station includes, but is not limited to, equipment associated with wireless communications services such as private, broadcast, and public safety services, as well as unlicensed wireless services and fixed wireless services such as microwave backhaul.
- b. The term Base Station includes, but is not limited to, radio transceivers, antennas, coaxial or fiber-optic cable, regular and backup power supplies, and comparable equipment, regardless of technological configuration (including Distributed Antenna Systems and small-cell networks).
- c. The term Base Station includes any structure other than a tower that, at the time an eligible facilities modification application is filed with the City under this Code, supports or houses equipment described in paragraphs a-b above, and that has been reviewed and approved under the applicable zoning or siting process, or under another State, county or local regulatory review process, even if the structure was not built for the sole or primary purpose of providing such support.
- d. The term Base Station does not include any structure that, at the time a completed eligible facilities modification application is filed with the City, does not support or house equipment described in paragraphs a-c above.

C.

Carrier on Wheels or Cell on Wheels (COW). A portable self-contained Telecommunications Facility that can be moved to a location and set up to provide wireless services on a temporary or emergency basis. A COW is normally vehicle-mounted and contains a telescoping boom as the Antenna support structure.

Collocation. The mounting or installation of transmission equipment on an existing support structure for the purpose of transmitting, receiving, or both transmitting and receiving radio frequency signals for communication purposes. When applied to Eligible Facilities Requests, Collocation means the mounting or installation of transmission equipment on an eligible support structure.

Concealed Telecommunications Facility. Any Telecommunications Facility that is integrated as an architectural feature of an Existing Structure or any new Support Structure designed so that the purpose of the Facility or Support Structure for providing wireless services is not readily apparent to a casual observer. Concealment shall also refer to an eligible support structure and transmission facility designed to look like some feature other than a wireless tower or base station.

D.

E.

Electromagnetic field (EMF). The field produced by the operation of equipment used in transmitting and receiving radio frequency signals.

Eligible Facilities Request. Any request for modification of an existing tower or base station that does not substantially change the physical dimensions of such tower or base station, involving:

- a. Collocation of new transmission equipment;
- b. Removal of transmission equipment; or
- c. Replacement of transmission equipment.

Eligible Support Structure. Any existing tower or base station as defined in this Section, provided that it is existing at the time the relevant application is filed with the City under this Chapter.

Equipment shelter. The structure associated with a PWSF that is used to house electronic switching equipment, cooling systems, and back-up power systems.

Existing. As applied to a tower or base station, means a constructed tower or base station that has been reviewed and approved under the applicable zoning process of the City or another agency with jurisdiction. With regard to a telecommunications facility, it is a previously erected Support Structure or other structure, e.g., buildings or water tanks, to which Telecommunications Facilities may be attached.

F.

FAA. The Federal Aviation Administration.

FCC. The Federal Communications Commission.

G.

Guyed Tower. A support structure, such as a pole or narrow metal framework, which is held erect by the use of wires, anchors, or a combination of wires and anchors. This definition is used whether the tower is partially, temporarily, or additionally guyed.

H.

I.

J.

K.

L.

Lattice Tower. A support structure that consists of a network of crossed metal braces, forming a tower which is usually triangular or square in cross-section.

M.

Major Modifications. Improvements to existing Telecommunications Facilities or Support Structures that result in a Substantial Increase to the Existing Structure. Collocation of new Telecommunications Facilities to an existing Support Structure without Replacement of the structure shall not constitute a Major Modification.

Microcell. A wireless communications facility consisting of an antenna that is either:

- a. Four feet in height and with an area of not more than 580 square inches; or
- b. If a tubular antenna, no more than twelve (12) inches in diameter and no more than six feet high.

Minor facility. A wireless communications facility consisting of up to three (3) antennas, each of which is either:

- a. Four (4) feet in height and with an area of not more than 580 square inches;
- b. If a tubular antenna, no more than twelve (12) inches in diameter and no more than six (6) feet high; and the associated equipment cabinets that are less than or equal to six (6) feet in height and no more than forty-eight (48) square feet in floor area; or
- c. A whip antenna which is four (4) inches or less in diameter and no more than fifteen (15) feet in length.

Minor Modification. Improvements to Existing Structures that result in some material change to the Facility or Support Structure but of a level, quality or intensity that is less than a Substantial Increase. Minor Modifications include the Replacement of the Structure.

Monopole. A single tubular support structure erected as a freestanding pole supporting one or more Antenna. A Monopole is not a Tower.

N.

O.

Ordinary Maintenance. Ensuring that Telecommunications Facilities and Support Structures are kept in good operating condition. Ordinary Maintenance includes inspections, testing and modifications that maintain functional capacity, aesthetic and structural integrity. Ordinary Maintenance includes replacing Antennas of a similar size, weight, shape and color and Accessory Equipment within an existing Telecommunications Facility and relocating the Antennas of approved Telecommunications Facilities to different height levels on an existing Monopole or tower upon which they are currently located. Ordinary Maintenance does not include Minor and Major Modifications.

P.

Personal Wireless Service Facilities. Unstaffed facilities that are used for the transmission or reception, or both, of personal wireless services, including, but not necessarily limited to, antenna arrays, transmission cables, equipment shelters and support structures.

Q.

R.

Replacement. Constructing a new Support Structure of proportions and of equal height or such other height that would not constitute a Substantial Increase to a pre-existing Support Structure in order to support a Telecommunications Facility or to accommodate Collocation and removing the pre-existing Support Structure.

S.

Site. For towers other than towers in the public rights-of-way, shall mean and refer to the current boundaries of the leased or owned property surrounding the tower and any access or utility easements currently related to the site, and, for other Eligible Support Structures, shall mean and be further restricted to, that area in proximity to the structure and to other transmission equipment already deployed on the ground.

Small cells. Compact WCFs containing their own transceiver equipment and function like cells in a mobile network but provide a smaller coverage area than traditional macrocells. Small cells must meet the parameters in Subsections a-b below. For purposes of these definitions, volume is a measure of the exterior displacement, not the interior volume of the enclosures. Antennas or equipment concealed from public view in or behind an otherwise approved structure or concealment are not included in calculating volume.

a. Small Cell Antenna: Each antenna shall be no more than three (3) cubic feet in volume.

b. Small Cell Equipment. Each equipment enclosure shall be no larger than seventeen (17) cubic feet in volume. Associated conduit, mounting bracket or extension arm, electric meter, concealment, telecommunications demarcation box, ground-based enclosures, battery back-up power systems, grounding equipment, power transfer switch, and cut-off switch may be located outside the primary equipment enclosure(s) and are not included in the calculation of equipment volume.

Small cell network. A collection of interrelated small cell facilities designed to deliver personal wireless services.

Spectrum Act. The “middle Class Tax Relief and Job Creation Act of 2012,” (Public Law 112-96; codified at 47 U.S.C. Sec. 1455(a)).

Stealth design. Technology that minimizes the visual impact of wireless communications facilities by camouflaging, disguising, screening, and/or blending into the surrounding environment. Examples of stealth design include but are not limited to facilities disguised as trees, flagpoles, bell towers, utility and light poles, and architecturally screened roof-mounted antennas.

Substantial Change. A modification substantially changes the physical dimensions of an eligible support structure if it meets any of the following criteria:

a. For towers not in a public right-of-way, it increases the height of the tower by more than ten (10) percent or by the height of one (1) additional antenna array with separation from the nearest existing antenna not to exceed twenty feet, whichever is greater; for other eligible support structures, it increases the height of the structure by more than ten (10) percent, or by more than ten (10) feet, whichever distance is greater;

b. For towers not in a public right-of-way, it involves adding an appurtenance to the body of the tower what would protrude from the edge of the tower more than twenty (20) feet, or more than the width of the Tower structure at the level of the appurtenance, whichever is greater; for other eligible support structures, it involves adding an appurtenance to the body of the structure that would protrude from the edge of the structure by more than six (6) feet;

- c. For any eligible support structure, it involves installation of more than the standard number of new equipment cabinets for the technology involved, but not to exceed four cabinets; or for towers in the public rights-of-way and base stations, it involves installation of any new equipment cabinets on the ground if there are no pre-existing ground cabinets associated with the structure, or else involves installation of ground cabinets that are more than ten (10) percent larger in height or overall volume than any other ground cabinets associated with the structure;
- d. It entails any excavation or deployment outside the current site;
- e. It would defeat the concealment elements of the eligible support structure; or
- f. It does not comply with conditions associated with the siting approval of the construction or modification of the eligible support structure or base station equipment, provided however that this limitation does not apply to any modification that is non-compliant only in a manner that would not exceed the thresholds identified in this definition of "Substantial Change," Subsections a-f.

Support Structure. Any built structure, including any guy wires and anchors, to which antennas and other necessary associated hardware is mounted. Support structures may include, but are not limited to Lattice Towers; Guyed Towers; Monopoles; or Existing nonresidential structures that are identified in this chapter to which a PWSF may be attached with certain conditions.

T.

Telecommunications Facility. Any unmanned facility established for the purpose of providing wireless transmission of voice, data, images or other information including, but not limited to, cellular telephone service, personal communications service (PSC) and paging service. A Telecommunications Facility can consist of one or more Antennas and Accessory Equipment or one base station.

Tower. Any structure built for the sole or primary purpose of supporting any FCC-licensed or authorized antennas and their associated facilities, including structures that are constructed for wireless communications services including, but not limited to, private, broadcast and public safety services, as well as unlicensed wireless services and fixed wireless services such as microwave backhaul and the associated site. .

Tower Height. The vertical distance measured from the base of the tower structure at grade to the highest point of the structure including the antenna. A lightning rod, not to exceed ten (10) feet in height, may be exempted from the tower height measurement.

Transmission Equipment. Equipment that facilitates transmission for any wireless communication service licensed or authorized by the FCC, including, but not limited to, radio transceivers, antennas, coaxial or fiber-optic cable, and regular and backup power supply. The term includes equipment associated with wireless communications services including, but not limited to, private, broadcast, and public safety services, as well as unlicensed wireless services and fixed wireless services such as microwave backhaul.

U.

Unified Enclosure. A small cell facility providing concealment of antennas and equipment within a single enclosure.

Utility Support Structure. Utility poles or utility towers supporting electrical, telephone, cable, or other similar facilities; street light standards; pedestrian light standards; traffic light structures; traffic sign structures; or water towers.

V. _____

W. _____

Wireless Communications Facilities or WCF. A staffed or unstaffed facility or location for the transmission or reception of radio frequency (RF) signals or other wireless communications or other signals for commercial communications purposes, typically consisting of one or more antennas or group of antennas, a tower or attachment support structure, transmission cables and other transmission equipment and an equipment enclosure or cabinets.

X. _____

Y. _____

Z. _____

ORDINANCE NO. _____

AN ORDINANCE OF THE CITY OF EDGEWOOD, WASHINGTON, RELATING TO WIRELESS COMMUNICATION FACILITIES (WCF) AND THE STANDARDS AND PROCEDURES FOR PERMITTING, APPROVAL, COLLOCATION, REMOVAL, REPLACEMENT, DESIGN, AND MAINTENANCE OF NEW AND EXISTING WCFs TO CONFORM TO FEDERAL LAW AND APPLICABLE REGULATIONS; ESTABLISHING AN APPLICATION SUBMITTAL AND APPROVAL PROCESS; PROVIDING FOR TERMINATION OF NON-CONFORMING STRUCTURES; REPEALING SECTION 18.100.110 OF THE EDGEWOOD MUNICIPAL CODE (EMC); AND ADOPTING A NEW SECTION 18.100.110 TO THE EDGEWOOD MUNICIPAL CODE; PROVIDING FOR SEVERABILITY; AND ESTABLISHING AN EFFECTIVE DATE.

WHEREAS, in 1934, Congress enacted the Communications Act of 1934, creating the FCC and granting it authority over common carriers engaged in the provision of interstate or foreign communications services; and

WHEREAS, in 1996 Congress enacted Pub. L. No. 104-104, 110 Stat. 70 (the “1996 Act”), amending the Communications Act of 1934 and implementing regulations applicable to both wireless and wireline communications facilities for the purpose of removal of barriers to entry into the telecommunications market while preserving local government zoning authority except where specifically limited under the 1996 Act; and

WHEREAS, in the 1996 Act, Congress imposed substantive and procedural limitations on the traditional authority of state and local governments to regulate the location, construction, and modification of wireless facilities and incorporated those limitations into the Communications Act of 1934; and

WHEREAS, the City has adopted regulations that have been codified as part of the Municipal Code of the City establishing local requirements for the location, construction, and modification of wireless facilities; and

WHEREAS, in 2012 Congress passed the “Middle Class Tax Relief and Job Creation Act of 2012” (the “**Spectrum Act**”) (PL-112-96; codified at 47 U.S.C. § 1455(a)); and

WHEREAS, Section 6409 (hereafter “**Section 6409**”) of the Spectrum Act implements additional substantive and procedural limitations upon state and local government authority to regulate modification of existing wireless antenna support structures and base stations; and

WHEREAS, Congress through its enactment of Section 6409 of the Spectrum Act, has mandated that local governments approve, and cannot deny, an application requesting modification of an existing tower or base station if such modification does not substantially change the physical dimensions of such tower or base station; and

WHEREAS, the 1996 Act empowers the Federal Communications Commission (the “**FCC**”) to prescribe such rules and regulations as may be necessary in the public interest to carry out the provisions of the 1996 Act, and subsequently added portions of the 1996 Act such as Section 6409; and

WHEREAS, the FCC, pursuant to its rule making authority, adopted and released a Notice of Proposed Rulemaking in September of 2013 (*In re Acceleration of Broadband Deployment by Improving Wireless Facilities Siting Policies*, WT Docket Nos. 13-238, 13-32; WC Docket No. 11-59; FCC 13-122) which focused in part upon whether or not the FCC should adopt rules regarding implementation of Section 6409; and

WHEREAS, on October 21, 2014, the FCC issued its report and order, WT Docket Nos. 13-238, 13-32; WC Docket No. 11-59; FCC 14-153, in the above described proceeding (the “**Report and Order**” or “**Order**”) clarifying and implementing statutory requirements related to state and local government review of infrastructure siting, including Section 6409, with the intent of facilitating and expediting the deployment of equipment and infrastructure to meet the demand for wireless capacity; and

WHEREAS, the rules adopted by the FCC in its Report and Order implementing Section 6409 are intended by the FCC to spur wireless broadband deployment, in part, by facilitating the sharing of infrastructure that supports wireless communications through incentives to collocate on structures that already support wireless facilities; and

WHEREAS, the Report and Order also adopts measures that update the FCC’s review processes under the National Environmental Policy Act of 1969 (“**NEPA**”) and section 106 of the National Historic Preservation Act of 1966 (“**NHPA**”), with a particular emphasis on accommodating new wireless technologies that use smaller antennas and compact radio equipment to provide mobile voice and broadband service; and

WHEREAS, on January 5, 2015, the FCC released an Erratum to the Report and Order making certain amendments to the provisions of the Report and Order related to NEPA and Section 106 of the NHPA; and

WHEREAS, that part of the Report and Order related to implementation of Section 6409, amends 47 C.F.R. Part 1 (PART 1 – PRACTICE AND PROCEDURE) by adding new Subpart CC § 1.40001 and establishing both substantive and procedural limitations upon local government application and development requirements applicable to proposals for modification to an existing antenna support structure or an existing base station (“**Eligible Facility Request Rules**”); and

WHEREAS, the Order, among other things, defines key terms utilized in Section 6409, establishes application requirements limiting the information that can be required from an applicant, implements a 60 shot clock and tolling provisions, establishes a deemed approved remedy for applications not timely responded to, requires cities to approve a project permit application requesting modification of an existing tower or base station that does not substantially change the physical dimensions of such tower or base station, and establishes development standards that govern such proposed modifications; and

WHEREAS, the Report and Order provides that the Eligible Facility Request Rules will be effective 90 days following publication in the Federal Register; and

WHEREAS, the Order was published in the Federal Register on Thursday, January 8, 2015, Federal Register; Vol. 80; No. 5, resulting in the Eligible Facility Request Rules becoming effective on April 8, 2015; and

WHEREAS, the Order is subject to appeal, however, even if an appeal is filed, the appeal will not automatically delay implementation of the Eligible Facility Request Rules; and

WHEREAS, the City Council finds that it is required under Section 6409 of the Spectrum Act and the Eligible Facility Request Rules established in the Order, to adopt and implement local development and zoning regulations that are consistent with Section 6409 and the Order; and

WHEREAS, an Environmental Checklist for a non-project action was prepared under the State Environmental Policy Act (RCW Chapter 43.21.C), pursuant to Washington Administrative Code Chapter 197-11, and a determination of Non-Significance (“DNS”) was issued on the 20th day of June, 2018; and

WHEREAS, in accordance with RCW 36.70A.106 and WAC 365-196-630, a notice of intent to adopt the proposed new development regulations was sent to the State of Washington Department of Commerce and to other state agencies to allow for a 60-day review and comment period, which comment period ended prior to adoption of this ordinance; and

WHEREAS, the Planning Commission held a Public Hearing to receive public testimony regarding the proposed code amendment at their July 9, 2018 meeting; and

WHEREAS, after the public hearing, the Planning Commission submitted a formal recommendation for approval of the draft code the City Council; and

WHEREAS, the City Council held a public hearing on **August 14, 2018**; and

WHEREAS, the City Council considered this ordinance, the Planning Commission’s recommendation, and the public’s input received during the prior public hearings at its regular City Council meeting of **August 28, 2018**; and

WHEREAS, the City Council finds that the proposed development and zoning regulations are reasonable and necessary in order bring the City’s development regulations into compliance with the mandate imposed upon the City by Congress pursuant to Section 6409 and the regulations imposed upon the City by the FCC pursuant to its Report and Order, and are therefore in the public interest; and

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF EDGEWOOD, WASHINGTON, DO ORDAIN AS FOLLOWS:

- Section 1.** Section 18.100.110 of the Edgewood Municipal Code is hereby repealed.
- Section 2.** A new Section 18.100.110 to the Edgewood Municipal Code is hereby adopted, all as set forth in Exhibit A, which attached hereto and incorporated herein by this reference.
- Section 3.** Severability. Should any section, paragraph, sentence, clause or phrase of this ordinance, or its application to any person or circumstance be declared unconstitutional or otherwise invalid for any reason, or should any portion of this ordinance be preempted by state or federal law or

regulation, such decision or preemption shall not affect the validity of the remaining portions of this ordinance or its application to other persons or circumstances.

Section 4. Effective Date and Publication. A summary of this ordinance consisting of its title shall be published in the official newspaper of the City. This ordinance shall take effect and be in full force five (5) days after the date of publication.

ADOPTED BY THE CITY COUNCIL ON THE 28TH DAY OF AUGUST, 2018.

Daryl Eiding, Mayor

ATTEST/AUTHENTICATED:

Rachel Pitzel, City Clerk

APPROVED AS TO FORM:

Carol Morris, CITY ATTORNEY

DATE OF PUBLICATION:
EFFECTIVE DATE:



City Of Edgewood Council Agenda Summary Sheet

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SUBJECT: Herrera Environmental Consulting Contract for the continuation of work on the 2018 Surface Water Management Plan Update.	Agenda Item #:	2G
	For Agenda of:	8/07/2018
	Prepared by:	Dave Grey
ATTACHMENTS (list): ☐ Resolution 18-xxxx ☐ Professional Services Agreement ☐ Exhibit A and B		
Mayor, Daryl Eidinger	☒	Expenditure Required: <u>\$65,417.02</u>
Asst. City Administrator, Dave Gray	☐	Amount Budgeted: <u>\$65,417.02</u>
City Attorney, Carol Morris	☐	Appropriation Required: _____
City Clerk, Rachel Pitzel	☐	Timeline: Final Product Completion 10/31/2018
Community Development Director, Darren Groth	☐	
Public Works, Jeremy Metzler	☐	BARS: 41000000531384102 SW Plan Update
Fiscal Note/Consideration: The 2018 Budget was amended (2018 BA3) to pull \$47,723.02 over that was appropriated in the 2017 Budget but unspent on December 31, 2017, and added \$2,694.00 to the \$15,000 2018 Budget appropriation, to complete the Surface Water Management Plan. The original budgeted cost expected for the completion of the study was \$197,350. Final Cost is \$200,044.00, or \$2.694 over the original estimate. This increase was authorized by Council with Budget Amendment 2018-3 and is funded by reducing the Surface Water Fund Beginning Fund Balance. The original contract for Herrera's services expired on December 31, 2017, prior to the total expenditure of \$182,350. At the expiration, the work completed totaled \$134,626.98, the work not completed originally authorized by Council was \$47,723.02. Budget Amendment 2018 No.3 authorizes the 2018 budget increased by that amount to complete the work originally scheduled and budgeted in 2017. The remainder of the contract work, budgeted in 2018 at \$15,000. The final contract to complete Herrera's work will be \$200,044. The 2018 work yet to be completed will be for \$65,417.02.		
SUMMARY STATEMENT: Changes were made to the scope of work for the 2018 Surface Water Management Plan Update, as described in Exhibit A to the contract. In some instances, there were cost overruns (Deep Infiltration Feasibility Assessment), while in others, certain tasks became unnecessary, and saved 60 hours of projected work from the original budget (Capital Improvement Program for Stormwater Facilities). This portion of the Update also includes tasks that were not included in the original project scope (Systems Development Charge Analysis). A new schedule for completion of all tasks appears in Section B of Exhibit A.		
COUNCIL COMMITTEE REVIEW AND RECOMMENDATION:		
RECOMMENDED ACTION: MOTION to approve the Mayor's execution of the Contract for Professional Services with Herrera Environmental Consulting, Inc., for a continuation of the work on the 2018 Surface Water Management Plan Update, in an amount not to exceed \$65,417.02.		
ALTERNATIVES TO RECOMMENDED ACTION: 1) Do not adopt 2) Forward to Study Session for further review		

RESOLUTION NO. 18-0XXX

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF EDGEWOOD, PIERCE COUNTY, WASHINGTON AUTHORIZING THE MAYOR TO EXECUTE A PROFESSIONAL SERVICES AGREEMENT WITH HERRERA ENVIRONMENTAL CONSULTANTS (HERRERA), IN THE AMOUNT OF \$65,417.02, FOR THE CONTINUATION OF WORK ON THE 2018 SURFACE WATER MANAGEMENT PLAN UPDATE.

WHEREAS, the City's current Surface Water Management Plan (SWMP) was developed and adopted in 1997, and while additional study and updates have been drafted since, there has not been a comprehensive update to the SWMP in over 20 years; and

WHEREAS, the City advertised for qualified consultants to aide City Staff in this task and an initial screening panel, including the Assistant City Administrator of Municipal Services, Community Development Director, and Senior Stormwater Engineer reviewed and scored the proposals; and

WHEREAS, the two most-qualified respondents were interviewed by a panel, including the Mayor, Community Development Director, Senior Stormwater Engineer, City Clerk, and Manager of Mountain View – Edgewood Water Company; and

WHEREAS, the interview panel unanimously scored and recommended Herrera Environmental Consultants (Herrera) as the firm most qualified and willing to provide the necessary services; and

WHEREAS, the work conducted by Herrera was not completed by the end of 2017 leaving \$47,723.02 of the original appropriated budget of \$182,350 unspent at the end of the year and rolled into the ending fund balance for the Surface Water Fund; and

WHEREAS, the City Council appropriated \$47,723.02 in Budget Amendment 3 on July 10th, 2018 with Ordinance 18-0524, to pull the 2017 appropriated but unspent funding into 2018, as well as increasing the original 2018 appropriation for the study of \$15,000 by an additional \$2,694, to complete all tasks to finalize the Surface Water Management Plan work by Herrera; and

WHEREAS, the total cost for the Surface Water Management Plan, originally estimated at a total of \$197,300 has cost \$200,044.00 expended in 2017 (\$134,626.98) and 2018 (\$65,417.02);

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF EDGEWOOD, WASHINGTON, DOES RESOLVE AS FOLLOWS:

Section 1. The Mayor is hereby authorized to execute an agreement for Surface Water Management Plan updates, attached hereto as Exhibit A, with Herrera Environmental Consultants, Inc. for a contract amount not to exceed \$65,417.02.

PASSED BY THE CITY COUNCIL OF THE CITY OF EDGEWOOD,

09/07/18 Study Session
Page 157 of 171

**WASHINGTON, AT A REGULAR MEETING THEREOF, THIS 14TH DAY OF
AUGUST, 2018**

Daryl Eiding, Mayor

ATTEST:

Rachel Pitzel, City Clerk

CITY OF EDGEWOOD PROFESSIONAL SERVICES AGREEMENT

THIS Agreement is made effective as of the 26th day of June, 2018, by and between the City of Edgewood, a municipal corporation, organized under the laws of the State of Washington, whose address is:

CITY OF EDGEWOOD, WASHINGTON (hereinafter the “CITY”)
2224 - 104th Avenue E.
Edgewood, Washington 98372
Contact: Mayor Daryl Eidinger Phone: 253-952-3299 Fax: 253-952-3537

and Herrera Environmental Consultants, Inc., a corporation, organized under the laws of the State of Washington, doing business at:

Herrera Environmental Consultants, Inc. (hereinafter the “CONSULTANT”)
2200 Sixth Avenue, Suite 1100
Seattle, WA 98121
Contact: Joy Michaud Phone: 360-790-5789 Fax: 206-441-9108

for professional services in connection with the following Project:

Continuation of the 2018 Surface Water Management Plan Update

TERMS AND CONDITIONS

1. Services by Consultant.

A. Consultant shall perform the services described in the Scope of Work attached to this Agreement as Exhibit "A." The services performed by the Consultant shall not exceed the Scope of Work without prior written authorization from the City.

B. The City may from time to time require changes or modifications in the Scope of Work. Such changes, including any decrease or increase in the amount of compensation, shall be agreed to by the parties and incorporated in written amendments to the Agreement.

2. Schedule of Work.

A. Consultant shall perform the services described in the scope of work in accordance with the Schedule attached to this contract as Exhibit “A.” If delays beyond Consultant's reasonable control occur, the parties will negotiate in good faith to determine whether an extension is appropriate.

B. Consultant is authorized to proceed with services upon receipt of a written Notice to Proceed.

3. Terms. This Agreement shall commence on August 15, 2018, (“Commencement Date”) and shall terminate on October 31, 2018 unless extended or terminated in writing as provided herein.

4. Compensation.

- ☐ LUMP SUM. Compensation for these services shall be a Lump Sum of \$ _____, which includes all applicable tax.
- ☒ TIME AND MATERIALS NOT TO EXCEED. Compensation for these services shall not exceed \$ 65,417.02, including all applicable tax, without written authorization and will be based on billing rates and reimbursable expenses attached hereto as Exhibit "B."
- ☐ TIME AND MATERIALS. Compensation for these services shall be on a time and material basis according to the list of billing rates and reimbursable expenses attached hereto as Exhibit "_____."
- ☐ OTHER. _____

5. Payment.

A. Consultant shall maintain time and expense records and provide them to the City monthly after services have been performed, along with monthly invoices in a format acceptable to the City for work performed to the date of the invoice.

B. All invoices shall be paid by City warrant within sixty (60) days of receipt of a proper invoice. If the City objects to all or any portion of any invoice, it shall so notify the Consultant of the same within fifteen (15) days from the date of receipt and shall pay that portion of the invoice not in dispute, and the parties shall immediately make every effort to settle the disputed portion.

C. Consultant shall keep cost records and accounts pertaining to this Agreement available for inspection by City representatives for three (3) years after final payment unless a longer period is required by a third-party agreement. Copies shall be made available on request.

D. On the effective date of this Agreement (or shortly thereafter), the Consultant shall comply with all federal and state laws applicable to independent contractors, including, but not limited to, the maintenance of a separate set of books and records that reflect all items of income and expenses of the Consultant's business, pursuant to Revised Code of Washington (RCW) 51.08.195, as required by law, to show that the services performed by the Consultant under this Agreement shall not give rise to an employer-employee relationship between the parties, which is subject to Title 51 RCW, Industrial Insurance.

E. If the services rendered do not meet the requirements of the Agreement, Consultant will correct or modify the work to comply with the Agreement. City may withhold payment for such work until the work meets the requirements of the Agreement.

6. Discrimination and Compliance with Laws

A. Consultant agrees not to discriminate against any employee or applicant for employment or any other person in the performance of this Agreement because of race, creed, color, national origin, marital status, sex, age, disability, or other circumstance prohibited by federal, state, or local law or ordinance, except for a bona fide occupational qualification.

B. Even though the Consultant is an independent contractor with the authority to control and direct the performance and details of the work authorized under this Agreement, the work must meet the approval of the City and shall be subject to the City's general right inspection to secure the satisfactory completion thereof. The Consultant agrees to comply with all federal, state and municipal laws, rules and regulations that are now effective or become applicable within the terms of this Agreement to the Consultant's business, equipment and personnel engaged in operations covered by this Agreement or accruing out of the performance of such operations.

C. Consultant shall obtain a City of Edgewood business license prior to receipt of written Notice to Proceed.

D. Violation of this Paragraph 6 shall be a material breach of this Agreement and grounds for cancellation, termination, or suspension of the Agreement by City, in whole or in part, and may result in ineligibility for further work for City.

7. Relationship of Parties. The parties intend that an independent contractor-client relationship will be created by this Agreement. As the Consultant is customarily engaged in an independently established trade which encompasses the specific service provided to the City hereunder, no agent, employee, representative or sub-consultant of the Consultant shall be or shall be deemed to be the employee, agent, representative or sub-consultant of the City. In the performance of the work, the Consultant is an independent contractor with the ability to control and direct the performance and details of the work, the City being interested only in the results obtained under this Agreement. None of the benefits provided by the City to its employees including, but not limited to, compensation, insurance, and unemployment insurance are available from the City to the employees, agents, representatives or sub-consultants of the Consultant. The Consultant will be solely and entirely responsible for its acts and for the acts of its agents, employees, representatives and sub-consultants during the performance of this Agreement. The City may, during the term of this Agreement, engage other independent contractors to perform the same or similar work that the Consultant performs hereunder.

8. Suspension and Termination of Agreement

A. Termination without cause. This Agreement may be terminated by the City at any time for public convenience, for the Consultant's insolvency or bankruptcy, or the Consultant's assignment for the benefit of creditors.

B. Termination with cause. The Agreement may be terminated by the City upon the default of the Consultant. Upon 30 days' notice and reasonable cause, as determined by the sole discretion of the City, the Agreement may be terminated by the Consultant.

C. Rights Upon Termination.

1. *With or Without Cause.* Upon termination for any reason, all finished or unfinished documents, reports, or other material or work of Consultant pursuant to this Agreement shall be submitted to City, and Consultant shall be entitled to just and equitable compensation for any satisfactory work completed prior to the date of termination, not to exceed the total compensation set forth herein. Consultant shall not be entitled to any reallocation of cost, profit or overhead. Consultant shall not in any event be entitled to anticipated profit on work not performed because of such termination. Consultant shall use its best efforts to minimize the compensation payable under this Agreement in the event of such termination. Upon termination, the City may take over the work and prosecute the same to completion, by contract or otherwise.

2. *Default.* If the Agreement is terminated for default, the Consultant shall not be entitled to receive any further payments under the Agreement until all work called for has been fully performed. Any extra cost or damage to the City resulting from such default(s) shall be deducted from any money due or coming due to the Consultant. The Consultant shall bear any extra expenses incurred by the City in completing the work, including all increased costs for completing the work, and all damage sustained, or which may be sustained by the City by reason of such default.

D. Suspension. The City may suspend this Agreement, at its sole discretion. Any reimbursement for expenses incurred due to the suspension shall be limited to the Consultant's reasonable expenses, and shall be subject to verification. The Consultant shall resume performance of services under this Agreement without delay when the suspension period ends.

E. Notice of Termination or Suspension. If delivered to the Consultant in person, termination shall be effective immediately upon the Consultant's receipt of the City's written notice or such date as stated in the City's notice of termination, whichever is later. Notice of suspension shall be given to the Consultant in writing upon one week's advance notice to Consultant. Such notice shall indicate the anticipated period of suspension. Notice may also be delivered to the Consultant at the address set forth in Section 15 herein.

9. Standard of Care. Consultant represents and warrants that it has the requisite training, skill and experience necessary to provide the services under this agreement and is appropriately accredited and licensed by all applicable agencies and governmental entities. Services provided by Consultant under this agreement will be performed in a manner consistent with that degree of care and skill ordinarily exercised by members of the same profession currently practicing in similar circumstances.

10. Ownership of Work Product.

A. All data materials, reports, memoranda, and other documents developed under this Agreement whether finished or not shall become the property of City, shall be forwarded to City at its request and may be used by City as it sees fit. Upon termination of this agreement pursuant to paragraph 8 above, all finished or unfinished documents, reports, or other material or work of Consultant pursuant to this Agreement shall be submitted to City.

B. All written information submitted by the City to the Consultant in connection with the services performed by the Consultant under this Agreement will be safeguarded by the Consultant to at least the same extent as the Consultant safeguards like information relating to its own business. If such information is publicly available or is already in Consultant's possession or known to it, or is rightfully obtained by the Consultant from third parties, the Consultant shall bear no responsibility for its disclosure, inadvertent or otherwise.

11. Work Performed at the Consultant's Risk. The Consultant shall take all precautions necessary and shall be responsible for the safety of its employees, agents and sub-consultants in the performance of the work hereunder, and shall utilize all protection necessary for that purpose. All work shall be done at the Consultant's own risk, and the Consultant shall be responsible for any loss or damage to materials, tools, or other articles used or held by the Consultant for use in connection with the work.

12. Indemnification. The Consultant shall defend, indemnify and hold the City, its officers, officials, employees, agents and volunteers harmless from any and all claims, injuries, damages, losses or suits, including all legal costs and attorneys' fees, arising out of or resulting from the acts, errors or omissions of the Consultant in performance of this Agreement, except for injuries and damages caused by the sole negligence of the City. The City's inspection or acceptance of any of the Consultant's work when completed shall not be grounds to avoid any of these covenants of indemnification.

Should a court of competent jurisdiction determine that this Agreement is Subject to RCW 4.24.115, then, in the event of liability for damages arising out of bodily injury to persons or damages to property caused by or resulting from the concurrent negligence of the Consultant and the City, its officers, officials, employees, agents and Volunteers, the Consultant's liability hereunder shall be only to the extent of the Consultant's negligence.

IT IS FURTHER SPECIFICALLY AND EXPRESSLY UNDERSTOOD THAT THE INDEMNIFICATION PROVIDED HEREIN CONSTITUTES THE CONSULTANT'S WAIVER OF IMMUNITY UNDER INDUSTRIAL INSURANCE, TITLE 51 RCW, SOLELY FOR THE PURPOSES OF THIS INDEMNIFICATION. THE PARTIES FURTHER ACKNOWLEDGE THAT THEY HAVE MUTUALLY NEGOTIATED THIS WAIVER. THE CONSULTANT'S WAIVER OF IMMUNITY UNDER THE PROVISIONS OF THIS SECTION DOES NOT INCLUDE, OR EXTEND TO, ANY CLAIMS BY THE CONSULTANT'S EMPLOYEES DIRECTLY AGAINST THE CONSULTANT.

13. Insurance. The Consultant shall procure and maintain for the duration of the Agreement, insurance against claims for injuries to persons or damage to property which may arise from or in connection with the performance of the work hereunder by the Consultant, its agents, representatives, or employees.

A. Minimum Scope of Insurance

Consultant shall obtain insurance of the types described below:

1. Automobile Liability insurance covering all owned, non-owned, hired and leased vehicles. Coverage shall be written on Insurance Services Office (ISO) form CA 00 01 or a substitute form providing equivalent liability coverage. If necessary, the policy shall be endorsed to provide contractual liability coverage.
2. Commercial General Liability insurance shall be written on ISO occurrence form CG 00 01 or a substitute form providing equivalent liability coverage and shall cover liability arising from premises, operations, independent contractors and personal injury and advertising injury. The City shall be named by endorsement as an additional insured under the Consultant's Commercial General Liability insurance policy with respect to the work performed for the City.
3. Workers' Compensation coverage as required by the Industrial Insurance laws of the State of Washington and Employer's Liability Insurance.
4. Professional Liability insurance appropriate to the Consultant's profession.

B. Minimum Amounts of Insurance

Consultant shall maintain the following insurance limits:

1. Automobile Liability insurance with a minimum combined single limit for bodily injury and property damage of \$1,000,000 per accident.
2. Commercial General Liability insurance shall be written with limits no less than \$1,000,000 each occurrence, \$2,000,000 general aggregate.
3. Professional Liability insurance shall be written with limits no less than \$1,000,000 per claim and \$1,000,000 policy aggregate limit.
4. Employer's Liability insurance each accident \$1,000,000; Employer's Liability Disease each employee \$1,000,000; and Employer's Liability Disease – Policy Limit \$1,000,000.

C. Other Insurance Provisions

The insurance policies are to contain, or be endorsed to contain, the following provisions for Automobile Liability, Professional Liability and Commercial General Liability insurance:

1. The Consultant's insurance coverage shall be primary insurance as respect the City. Any insurance, self-insurance, or insurance pool coverage maintained by the City shall be excess of the Consultant's insurance and shall not contribute with it.
2. The Consultant's insurance shall be endorsed to state that coverage shall not be cancelled by either party, except after thirty (30) days prior written notice by certified mail, return receipt requested, has been given to the City.
3. The City will not waive its right to subrogation against the Consultant. The Consultant's insurance shall be endorsed acknowledging that the City will not waive their right to subrogation. The Consultant's insurance shall be endorsed to waive the right of subrogation against the City, or any self-insurance, or insurance pool coverage maintained by the City.
4. If any coverage is written on a "claims made" basis, then a minimum of a three (3) year extended reporting period shall be included with the claims made policy, and proof of this extended reporting period provided to the City.

D. Acceptability of Insurers

Insurance is to be placed with insurers with a current A.M. Best rating of not less than A:VII.

E. Verification of Coverage

Consultant shall furnish the City with original certificates and a copy of the amendatory endorsements, including but not necessarily limited to the additional insured endorsement, evidencing the insurance requirements of the Consultant before commencement of the work.

14. Assigning or Subcontracting. Consultant shall not assign, transfer, subcontract or encumber any rights, duties, or interests accruing from this Agreement without the express prior written consent of the City, which consent may be withheld in the sole discretion of the City.

15. Notice. Any notices required to be given by the City to Consultant or by Consultant to the City shall be in writing and delivered to the parties at the following addresses:

Daryl Eidinger
Mayor
2224 - 104th Avenue E.
Edgewood, WA 98372

Phone: 253-952-3299
Fax: 253-952-3537

Herrera Environmental Consultants, Inc.
Attn: Joy Michaud
2200 Sixth Avenue, Suite 1100
Seattle, WA 98121

Phone: 360 790-5789
Fax: 206-441-9108

16. Resolution of Disputes and Governing Law.

A. Should any dispute, misunderstanding or conflict arise as to the terms and conditions contained in this Agreement, the matter shall first be referred to the Mayor, who shall determine the term or provision's true intent or meaning. The Mayor shall also decide all questions which may arise between the parties relative to the actual services provided or to the sufficiency of the performance hereunder.

B. If any dispute arises between the City and the Consultant under any of the provisions of this Agreement which cannot be resolved by the Mayor or Administrator's determination in a reasonable time, or if the Consultant does not agree with the Mayor or Administrator's decision on a disputed matter, jurisdiction of any resulting litigation shall be filed in Pierce County Superior Court, Pierce County, Washington.

C. This Agreement shall be governed by and construed in accordance with the laws of the State of Washington. In any suit or action instituted to enforce any right granted in this Agreement, the substantially prevailing party shall be entitled to recover its costs, disbursements, and reasonable attorney's fees from the other party.

17. General Provisions.

A. Non-waiver of Breach. The failure of either party to insist upon strict performance of any of the covenants and agreements contained herein, or to exercise any option herein contained in one or more instances, shall not be construed to be a waiver or relinquishment of said covenants, agreements, or options, and the same shall be in full force and effect.

B. Modification. No waiver, alteration, modification of any of the provisions of this Agreement shall be binding unless in writing and signed by a duly authorized representative of the City and the Consultant.

C. Severability. The provisions of this Agreement are declared to be severable. If any provision of this Agreement is for any reason held by a court of competent jurisdiction to be invalid or unconstitutional, such invalidity or unconstitutionality shall not affect the validity or constitutionality of any other provision.

D. Entire Agreement. The written provisions of this Agreement, together with any Exhibits attached hereto, shall supersede all prior verbal statements of any officer or other representative of the

City, and such statements shall not be effective or be construed as entering into or forming a part of or altering in any manner whatsoever, the Agreement or the Agreement documents. The entire agreement between the parties with respect to the subject matter hereunder is contained in this Agreement and the Exhibits attached hereto, which may or may not have been dated prior to the execution of this Agreement. All of the above documents are hereby made a part of this Agreement and form the Agreement document as fully as if the same were set forth herein. Should any language in any of the Exhibits to this Agreement conflict with any language contained in this Agreement, then this Agreement shall prevail.

IN WITNESS WHEREOF, the parties have executed this Agreement on the day and year set forth above.

CITY OF EDGEWOOD, WASHINGTON

CONSULTANT

By: _____
Daryl Eidinger
Mayor

By: _____
Name: _____

Date: _____

Title: _____

Date: _____

Attest:

By: _____
Rachel Pitzel
City Clerk

APPROVED AS TO FORM:

By: _____
Carol A. Morris
City Attorney

Scope of Work-

Completion of City of Edgewood Stormwater Management Plan

Herrera Environmental Consultants (Herrera) has recently submitted a public review draft of the City of Edgewood Stormwater Management Plan. As the work of the project team evolved, some aspects of development of this plan were beyond what was originally scoped and budgeted. This Scope of Work describes the work that was out of scope for each affected task and what remains for Plan completion. The budget summary table (Exhibit B) provides detailed calculations based on our original contract, work completed through December 31, 2017, work to be completed in 2018 identified in our original contract, and work to be completed in 2018 not in our original estimated but necessary to produce the final Surface Water Management Plan as identified by the City.

A. Scope of Work

Task 1.0 – Project Management

The original contract scope of work for Task 1 assumed that the project would last 12 months and the contract ended on December 31, 2017. The project schedule has been prolonged and as a result the City and Herrera have determined that an additional 8 months are needed to complete all scoped activities. This assumes a final public meeting at the end of June 2018 and final invoicing occurring by end of September 2018. Thus, the project management effort (e.g., coordination of active tasks, monthly progress reporting, and project management communications with the City) is proportionately increased. This additional work is accounted for in the attached budget. In addition to routine project management activities, work under this task has also included supporting the grant request and continuing to make contacts and collect information related to using UIC wells to infiltrate stormwater.

Task 4.0 – Deep Infiltration Feasibility Assessment

There were no specific out of scope activities associated with this task, however, the development of the issue paper was more extensive than originally expected including a more extensive literature review due to the level of concern associated with the assessment. The cost over-runs were somewhat offset by efficiencies in Tasks 2 and 3.

Task 5.0 – Capital Improvement Program for Stormwater Facilities

The contracted scope of work assumed that 2 to 3 project summary sheets would be prepared for the high priority CIPs (at a maximum of 40 hours). (Project summary sheets represent the culmination of the conceptual design work, graphics representing that work, and engineers cost estimates.) Instead, 7 project summary sheets; including one project with three separate very different alternatives were prepared and included in the plan. This extra work represents 3 to 4 times the projected workload or an

estimated 120 to 160 hours of additional work. However, due to the way the project progressed it was not necessary to complete a formal CIP project prioritization process which saved the budget approximately 60 hours of projected work. Thus, conservatively there was 60 hours (120 hours – 60 hours) of additional work between subtasks 5.2 and 5.3. This task is completed and no future costs are expected,

Task 6.0 – Public Outreach Support

This task has not started yet and the originally allocated budget appears adequate to complete this task.

Task 7.0 – Financial Analysis and Funding Plan

Details related to project needs and budget adjustments are provided in the appended budget request from FCS Group. FCS Group performed the systems development charge analysis which was not included in the original scope, they also performed the cash flow forecast twice to reflect revised capital improvement program expenditures, and have prepared and given presentations to two city council meetings when only one was scoped. FCS Group still needs to complete a draft and final report and provide the spreadsheet model before this task is complete.

Task 8.0 – Comprehensive Stormwater Management Plan

The contracted scope of work details one draft and one final report. As of end of April, in addition to releasing separate chapters for early review, two review drafts of the full plan were prepared. A significant change in watershed boundaries that was requested after the initial draft required fairly extensive changes to figures and tables and summaries that were beyond the anticipated effort for plan development. The plan is still in draft form pending final comments.

B. Scheduled Completion Dates:

The following dates are approximations. The final work product will be completed no later than October 31, 2018.

- 6/14 - Review MVEW comments, summarize and update website, public meeting notice
- 6/28 - Public Information Meeting, solicit public comment
- 7/3 - Council Study Session to discuss meeting and comments, confirm project prioritization, re-visit fees
- 7/5 - (*if needed*) Coordinate with FCS on changes to project funding
- 7/9 - Planning Commission discussion and input
- 7/10 - Coordinate any final changes to SWMP Narrative with Herrera
- 7/30 - Receive revised materials back from Herrera and FCS
- 7/31 & 8/7 - Review Final Draft SWMP Narrative and Fee Study with Council
- 8/14 - Council Public Hearing on Final Draft
- 8/21 - Final review and discussion with Council, review draft rate ordinance
- 8/28 - Council Adoption of SWMP Update, Public Hearing on rate ordinance
- 9/4 - Rate ordinance review and discussion with Council

- 9/11 - Council Adoption of rate ordinance

Budget

Completion of City of Edgewood Stormwater Management Plan

	Task 1	Task 2	Task 3	Task 4	Task 5	Task 6	Task 7	Task 8	Total
Original 2017 Contract Spent	\$9,628	\$5,528	\$11,767	\$41,745	\$25,921	\$0	\$16,901	\$23,136	\$134,627
Original 2017 Contract Not Spent	\$5,528	\$324	\$2,924	\$0	\$0	\$3,312	\$8,275	\$27,360	\$47,723
Total 2017 Appropriated for Plan	\$15,156	\$5,852	\$14,691	\$41,745	\$25,921	\$3,312	\$25,176	\$50,496	\$182,350
Original 2017 Contract Not Spent	\$5,528	\$324	\$2,924	\$0	\$0	\$3,312	\$8,275	\$27,360	\$47,723
2018 Plan Completion Additions	\$5,000	\$0	\$0	\$1,952	\$0	-\$3,312	\$8,348	\$5,706	\$17,694
Total 2018 Contract to be Spent	\$10,528	\$324	\$2,924	\$1,952	\$0	\$0	\$16,623	\$33,066	\$65,417
Total Completed Plan Cost	\$20,156	\$5,852	\$14,691	\$43,697	\$25,921	\$0	\$33,524	\$56,202	\$200,044

Project Name: <i>City of Edgewood</i> <i>Number of Tasks:</i> 8			
COST SUMMARY			
Labor			
Subconsultants			
GRAND TOTAL			
COST ITEMIZATION			
Labor			
			(2015 rates)
	Personnel		Rate/Hour
P6	Lenth, John	Vice President	\$212.13
P6	Michaud, Joy	Scientist VI	\$205.54
P5	Webb, Chris	Engineer V	\$197.69
P5	Hinman, Curtis	Scientist V	\$162.74
P4	Dugopolski, Rebecca	Engineer V	\$156.15
P4	Fontaine, Matthew	Engineer V	\$148.17
P4	Schmidt, Jennifer	GIS Analyst IV	\$135.74
P4	Gifford, Kristina	Technical Editor	\$135.25
P0	Mullen, Meghan	Engineer I	\$87.62
P3	Saavedra, Robin	Accounting Administra	\$95.40
A4	Jackowich, Pamela	Administrative Coordir	\$95.40
SUBTOTAL LABOR (Burdened Labor)			
SUBCONSULTANT COSTS			
		Unit	Cost
	AESI		1
	FCS		1
	Fee on Subconsultants @ 5%		5%
SUBTOTAL SUBCONSULTANT			