APPENDIX G

Regulatory Gap Analysis and Compliance Strategy Report

GAP ANALYSIS AND COMPLIANCE STRATEGY REPORT

CITY OF SEQUIM STORMWATER PROGRAM

Prepared for
City of Sequim

Prepared by
Herrera Environmental Consultants, Inc.

HERRERA

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

GAP ANALYSIS AND COMPLIANCE STRATEGY REPORT

CITY OF SEQUIM STORMWATER PROGRAM

Prepared for
City of Sequim
152 West Cedar Street
Sequim, Washington 98382

Prepared by
Herrera Environmental Consultants, Inc.
2200 Sixth Avenue, Suite 1100
Seattle, Washington 98121
Telephone: 206.441.9080

February 24, 2016

CONTENTS

Abbreviations iii

Introduction 1

- Background 1
- Methods of Analysis 2
  - Document Review 2
  - 2014 Stormwater Management Needs Assessment 2
  - Stormwater Workshop 3

Stormwater Program Assessment 5

- Current Stormwater Program Overview 5
  - Capital Facilities 5
  - Inspection Program 6
  - Water Quality Compliance 8
  - Species and Habitat Protection 15
  - Stormwater Design Guidance and Plan Review 17
  - Asset Management 20
  - Stormwater System Operations and Maintenance 22
  - Pollution Source Detection and Elimination 27
  - Public Education and Involvement 29

Staffing, Equipment, and Resources 35

- Staffing 35
- Equipment and Facilities 36
- Funding 38

Recommended Program Improvements 39

- Capital Facilities 39
- Inspection Program 39
- Water Quality Compliance 41
- Species and Habitat Protection 43
- Stormwater Design Guidance and Plan Review 44
- Asset Management 45
- Stormwater System Operations and Maintenance 46
- Pollution Source Detection and Elimination 48
- Public Education and Involvement 50

Conclusions 53

References 55

APPENDICES

Appendix A Background Document List
Appendix B Questionnaire

TABLES

Table 1. Inspection Program Gaps and Recommendations. 8
Table 2. Water Quality Compliance Gaps and Recommendations. 12
Table 3. Listed Species in the City of Sequim. 16
Table 4. Species and Habitat Protection Gaps and Recommendations. 17
Table 5. Stormwater Design Guidance and Plan Review Gaps and Recommendations. 19
Table 6. Asset Management Gaps and Recommendations. 21
Table 7. Stormwater System Operations and Maintenance Gaps and Recommendations 24
Table 8. Pollution Source Detection and Elimination Gaps and Recommendations. 28
Table 9. Public Education and Involvement Gaps and Recommendations. 32
Table 10. City of Sequim Stormwater Program Staff Support. 36
Table 11. City of Sequim Stormwater Program Equipment. 37
Table 12. City of Sequim Stormwater Program Funding. 38

ABBREVIATIONS

AWC	Association of Washington Cities
B-IBI	Benthic Index of Biotic Integrity
BMP	best management practice
CARA	Critical Aquifer Recharge Area
CIP	Capital Improvement Program
DOH	Washington State Department of Health
DRMT	Dungeness River Management Team
EPA	US Environmental Protection Agency
ESA	Endangered Species Act
FIP	Floodplain Insurance Program
FTE	full time equivalent
GIS	geographic information systems
I/I	infiltration and inflow
IDDE	Illicit Discharge Detection and Elimination
IPMP	Integrated Pest Management Plan
LID	low impact development
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
O&M	operations and maintenance
RSMP	Regional Stormwater Monitoring Program
SEPA	State Environmental Policy Act
SIDM	source identification and diagnostic monitoring
SMC	Sequim Municipal Code
SOP	standard operating procedure
SWMMWW	*Stormwater Management Manual for Western Washington*
SWMP	Stormwater Management Program
SWPPP	Stormwater Pollution Prevention Plan
TMDL	total maximum daily load plans
UIC	underground injection control
USFWS	US Fish & Wildlife Service
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife

WRIA	Water Resource Inventory Area
WSDOT	Washington State Department of Transportation
WSU	Washington State University

INTRODUCTION

BACKGROUND

Stormwater runoff has been a source of great concern for many years at global, regional, and local scales. There are a number of regulations related to stormwater management, water quality, flood protection, and habitat protection that affect the City of Sequim's (City) stormwater water program.

Regulations initiated by the Federal Water Pollution Control Act of 1972 (the Clean Water Act) include:

- State water quality standards
- Total maximum daily load (TMDL) cleanup action requirements for water bodies, on the Washington State Department of Ecology's (Ecology) Clean Water Act Section 303(d) list due to significant water quality degradation
- National Pollutant Discharge Elimination System (NPDES) Phase II municipal stormwater permit requirements (does not currently apply to the City)

The NPDES municipal stormwater program has been in place since 1990 and requires many jurisdictions that collect stormwater runoff to have a permit to regulate discharges from municipal separate stormwater systems into receiving waters.

The US Environmental Protection Agency (EPA) stormwater regulations established two phases—Phase I (for medium and large stormwater systems) and Phase II (for smaller stormwater systems)—for the NPDES municipal stormwater permit program. The EPA Phase II regulations went into effect in early 2003 and apply to permitted small municipalities.

In Washington State, Ecology develops and administers stormwater permits. Ecology issued the first NPDES Western Washington Phase II Municipal Stormwater Permit (NPDES Phase II Permit) in 2007. An updated NPDES Phase II Permit became effective in August 2013 and included most cities on the Olympic and Kitsap Peninsulas. Municipal stormwater permits are issued every five years, thus the current permit term runs through July 2018.

The City of Sequim is not currently an NPDES Phase II permittee, but does implement its own stormwater program.

Additional federal and state regulations that apply to the City's stormwater program include:

- Groundwater quality standards administered through the Model Toxics Control Act. Federal Safe Drinking Water Act and Water Pollution Control Act, and Groundwater Quality Standards (Chapter 173-200 WAC)
- Underground injection control (UIC) regulations (Chapter 173-218 WAC)

- Federal Endangered Species Act (ESA)
- Growth Management Act; critical areas ordinance
- State Environmental Policy Act (SEPA)
- Shoreline Management Act

These regulations will be described in detail in an appendix of the Master Plan.

The current City activities and identified needs related to the City's stormwater program are described in the City of Sequim Stormwater Management Needs Assessment (Sequim 2014). The purpose of this gap analysis and compliance strategy is to present a summary of the work that has already been performed, develop recommendations for the needs identified in the City's Stormwater Management Needs Assessment (Sequim 2014), and develop recommendations associated with needs identified in an initial stormwater workshop and from a review of existing documents. The goal of this report is to document all of these needs and recommendations in a single document and to thoroughly evaluate the staffing and funding needs to implement these recommendations. This gap analysis and compliance strategy will be used by City staff to provide direction and strategic guidance for the City's stormwater program and as the framework for the City's Storm and Surface Water Master Plan (Master Plan).

METHODS OF ANALYSIS

Herrera Environmental Consultants (Herrera), in coordination with City staff, compared current stormwater program activities, water quality conditions, and habitat conditions to applicable regulatory codes and standards as well as NPDES Phase II Permit requirements. Potential gaps and areas for improvement were identified through a review of available documents, a series of questionnaires sent to City staff, and meetings with City staff to discuss the stormwater program.

Document Review

Herrera reviewed pertinent documents identified and/or provided by the City, including City codes and ordinances, maps and Geographic Information Systems (GIS) data, planning documents, water quality data and studies, and stormwater planning documents, to provide a foundation for this stormwater program characterization. A complete list of background documents reviewed is provided in Appendix A.

2014 Stormwater Management Needs Assessment

In 2013–2014, the City conducted a Stormwater Management Needs Assessment (Sequim 2014). The Stormwater Management Needs Assessment included a compilation of data from technical reports, maps, GIS and other datasets, field inventories and inspections, and interviews and input from City street and utility crews. This information was used to document current physical and operational conditions of stormwater management in the city

as well as existing hydrologic and habitat conditions, capital facilities, flooding and water quality issues, and regulatory drivers pertinent to the City. Program gaps and needs were identified for each of the topics.

This report supplements the Stormwater Management Needs Assessment prepared by the City and also includes needs not previously identified.

Stormwater Workshop

In order to discuss the components of the City's stormwater program in additional detail and to identify previously undocumented issues, City staff members representing all aspects of the City's stormwater program were invited a workshop on November 18, 2014 to discuss the following topics:

- Stormwater program management
- Development and construction sites
- Capital Improvement Program (CIP)
- Stormwater maintenance

A questionnaire was distributed to participants in advance of the workshop to gather staff input and perspectives on key stormwater issues. The questionnaire responses were used to shape and facilitate the workshop discussion. A blank questionnaire is provided in Appendix B.

STORMWATER PROGRAM ASSESSMENT

CURRENT STORMWATER PROGRAM OVERVIEW

This section summarizes the City's current activities related to each stormwater program component, describes the applicable regulatory codes and standards as well as any potentially related NPDES Phase II Permit requirements, and provides recommendations for improving the City's stormwater program. Recommendations and program improvements provided below include recommendations from the City's Stormwater Management Needs Assessment (Sequim 2014), as well as additional needs identified during the workshop and document review.

The City's stormwater program components and needs were organized into the following categories:

1. Capital Facilities
2. Inspection Program
3. Water Quality Compliance
4. Species and Habitat Protection
5. Stormwater Design Guidance and Plan Review
6. Asset Management
7. Stormwater System Operations and Maintenance
8. Pollution Source Detection and Elimination
9. Public Education and Involvement

Capital Facilities

Current Activities

The City currently does not have a stormwater capital facilities program, but has identified a list of capital facility improvements in the Stormwater Management Needs Assessment (Sequim 2014).

Regulatory Requirements

The majority of the capital facilities projects identified in the Stormwater Management Needs Assessment (Sequim 2014) are not driven by regulatory requirements.

Gaps and Recommendations

In general, flooding and water quality issues within the City are grouped into the following categories:

- Bell Creek capacity
- Drywell maintenance/capacity
- General drainage issues (including direct discharge to creeks and misconnected street drains)
- Irrigation system related flooding
- Infiltration and inflow (I/I) to the sanitary sewer system

Capital facility improvements will be prioritized in the Known Stormwater Problems and Recommended Solutions section of the Master Plan.

Inspection Program

Current Activities

The City has established the legal authority to inspect and enforce construction and maintenance standards (Sequim Municipal Code (SMC) 13.104.370), but does not currently have sufficient staff to conduct or enforce inspections.

Regulatory Requirements

SMC 13.108 sets minimum standards for the inspection and maintenance of all stormwater facilities within the City. Provisions include monthly and annual inspections of different types of facilities, waste disposal, compliance, inspection authority. The City does not currently have sufficient staff to support these inspections.

- SMC 13.108.110 states that property owners are responsible for maintenance, operation or repair of stormwater drainage systems and BMPs and are required to maintain, operate and repair these facilities in compliance with Chapter 13.108 and the *Stormwater Management Manual for Western Washington* (SWMMWW).
- SMC 13.108.130 and SMC 13.108.140 state that the director is directed and authorized to develop an inspection program for stormwater facilities, and has the authority to develop and implement enforcement procedures.
- SMC 13.108.150 and SMC 13.108.160 describe the inspector's authority to inspect and the procedures to follow prior to making any inspections.
- SMC 13.108.170 requires the director to establish a master inspection and maintenance schedule to inspect appropriate stormwater facilities that are not owned by the City on an annual basis.

- SMC 13.108.180 stipulates that as stormwater facilities are encountered, they should be recorded and added to the master inspection and maintenance schedule.
- SMC 13.108.190 requires the director to report annually to the City council regarding the status of inspections.

For reference, Section S5.C.4.a-g of the NPDES Phase II Permit lists the following requirements:

- Inspect (prior to clearing and construction) all permitted development sites that have a high potential for sediment transport.
- Inspect all permitted development sites during construction to verify proper installation and maintenance of required erosion and sediment controls.
- Inspect all permitted development sites upon completion of construction and prior to final approval or occupancy to ensure proper installation of permanent stormwater treatment and flow control BMPs/facilities.
- Implement an ordinance or other enforceable mechanism to clearly identify the party responsible for maintenance.
- Establish maintenance standards that are as protective or more protective of facility function than those specified in the SWMMWW.
- Conduct annual inspections of all stormwater treatment and flow control BMPs/facilities constructed after 2007 that discharge to the stormwater drainage system and were permitted by the City.
- Inspect all permanent stormwater treatment and flow control BMPs/facilities and catch basins in new residential developments.
- Require maintenance of private stormwater facilities within the NPDES Phase II Permit -specified timeframes.
- Develop a recordkeeping procedure for inspection reports, warning letters, notices of violations, and other enforcement records.
- Provide copies of notice of intent (NOI) letters to representatives of proposed new development and redevelopment projects.

Gaps and Recommendations

Table 1 summarizes gaps identified in the Stormwater Management Needs Assessment (Sequim 2014) related to inspections. Additional gaps were identified in the document review and discussions with the City. Recommendations to address each of these gaps are also provided below.

Table 1. Inspection Program Gaps and Recommendations.			
Topic	**Source**	**Summary of Gap**	**Recommendations**
Non-City-owned stormwater facility inspections	Stormwater Management Needs Assessment (Sequim 2014)	The City should institute an inspection and record keeping program per SMC 13.108 – and be consistent in its requests for compliance from private landowners. Protocols may also be needed to ensure that non-City facilities are maintained according to City standards.	• Institute a stormwater facility inspection program • Develop maintenance standards for non-City-owned stormwater facilities (drains, drywells, infiltration lines, retention/detention ponds, etc.) • Require facility owners to submit inspection logs and maintenance reports annually. • Consider adding language to the property Plat that describes maintenance responsibilities and that can be passed down to the new owners. • Educate facility owners on maintenance responsibilities (use flyers and handouts). • Maintain records of private stormwater facility covenants and inspection logs. • Develop enforcement procedures for private stormwater facility maintenance, such as notification letters, required maintenance standards, maintenance tracking procedures, and a restitution process.
General O&M program	Stormwater Management Needs Assessment (Sequim 2014) and workshop	Agreements regarding the type and frequency of maintenance should be established with homeowner associations and commercial landowners as needed. The City has had to assist the School District with catch basin maintenance, which takes up City time and resources.	Establish maintenance agreements with homeowner associations, commercial landowners and School Districts addressing the type and frequency of maintenance activities as well as responsibilities for maintenance.

Water Quality Compliance

Current Activities

- The City does not have an active water quality protection program or dedicated staff, other than the Master Plan (currently under development).
- The City currently has over 150 UIC wells that have not yet been registered with Ecology.

- The City's current environmental monitoring includes standard wastewater treatment testing and analyses at the Water Reclamation Facility as well as surface water flow monitoring in 2014-15 along creeks and ditches entering and leaving the City.
- Herrera prepared a Water Quality Data Analysis Report for the City that synthesizes the results of water quality monitoring conducted through the following programs:
  - Water quality monitoring data collected by the Clallam County Streamkeepers in support of an EPA-funded project to develop a comprehensive stormwater monitoring program for Clallam County
  - Clean Water District monitoring
  - Puget Sound Stream Benthos – Benthic Index of Biotic Integrity (BIBI) data

Regulatory Requirements

Water Quality Assessment and 303(d) List

Ecology groups waterbodies into five categories as part of the state water quality assessment. To date, no waterbodies in the city are listed as Category 1 (meets tested standards for clean waters) or Category 3 (insufficient data). Ecology has listed a few waterbodies as Category 2 (waters of concern) and Category 4. Category 4 includes three subcategories: Category 4a (has a TMDL), Category 4b (has a pollution control program), and Category 4c (is impaired by a non-pollutant). The following water bodies in Sequim have been assessed and assigned Category 2 (waters of concern) or 4c (impaired by a non-pollutant):

- Bell Creek: fecal coliform, pH, and temperature (Category 2)
- Johnson Creek: fecal coliform, pH, and bioassessment (Category 2)
- Dungeness River: bioassessment (Category 2)
- Sequim Bay: dissolved oxygen(Category 2)
- Independent irrigation ditch (Sequim Prairie Tri): pH (Category 2)
- Strait of Juan de Fuca East: fish and shellfish habitat (Category 4c)

Category 5 is also known as the 303(d) list and identifies impaired waterbodies that have exceeded water quality standards for one or more pollutants. The most recent 303(d) list is the 2010 list developed by Ecology in 2010 and approved by the EPA in 2012. Ecology is now on a rotating schedule for completing the freshwater and marine water quality assessments and 303(d) lists, with the next freshwater quality assessment anticipated to be available in summer 2015. Total Maximum Daily Load (TMDL) plans or water cleanup plans are established for parameters identified on the 303(d) list. Ecology has included the following waterbodies on the 303(d) list of impaired waters (Category 5) for the following parameters:

- The lower reaches of Bell Creek: fecal coliform bacteria, dissolved oxygen, and Benthic Index of Biological Integrity (B-IBI)
- Lower reaches of Johnson Creek: fecal coliform bacteria
- Sequim Bay: fecal coliform bacteria and dissolved oxygen

No TMDL implementation plans have been developed by Ecology for these waterbodies or any other waterbodies or watersheds within the City limits. In order to avoid a future TMDL, the City could take action to develop a pollution control program for waterbodies currently on the 303(d) list of impaired waters. The components of a pollution control program are described below in Table 2. Some communities have found that there is an opportunity to reduce overall long-term costs since this type of program is controlled locally (Ecology 2011).

Groundwater Quality

A large portion of the City is underlain by former floodplain alluvium, making groundwater in the City susceptible to pollutants from infiltrated stormwater. High nitrate concentrations in the shallow aquifer around Sequim suggests that groundwater quality has been impacted by urban land uses and that other mobile contaminants may be present (Sequim 2014). Many small public wells in the City and County are down gradient of the urban center, and are at risk for groundwater contamination.

In 2005, Clallam County conducted a baseline study of stormwater contamination in drinking water wells down gradient from the City's western commercial zone. In 2009 to 2011, Clallam County conducted another study to identify and sample domestic wells with susceptibility to contamination by stormwater. This study showed no substantial evidence that stormwater runoff was contaminating the wells, concluded that the infiltration practices of the City have not caused widespread contamination (Sequim 2014).

The Washington State Department of Health (DOH) mandates that larger (Group A) systems that serve more than 15 connections and 25 people per day test must for and meet groundwater quality standards for various pollutants on varying frequencies (monthly to every three years), and smaller (Group B) systems that serve fewer than 15 connections and 25 people per day must test for and meet groundwater quality standards on a less frequent basis (Sequim 2014). Group A Public Water Supplies are regulated under WAC 246-290, and Group B Public Water Systems are regulated under WAC 246-291.

During routine groundwater quality testing required by the DOH in 2013, a non-City owned public water system in the northern portion of the City was found to contain trace levels of Freon 22. The City of Sequim, Clallam County, and Ecology worked together to investigate the limits of contamination and identify potential pollutant sources (Sequim 2014).

UIC Requirements

The City has stormwater facilities that discharge to ground waters of the state, therefore this is another regulatory requirement related to stormwater that should be addressed in the City's stormwater program. Chapter 173-218-090(1) WAC states that the following must be added to stormwater programs and implemented for UICs:

- UIC wells must be registered
- New UIC wells must be constructed according to Chapter 173-218 WAC specifications
- A well assessment must be completed for all existing wells
- Existing UIC wells that are determined to be a high threat to ground water must be retrofitted

UIC wells constructed prior to February 3, 2006 are considered to be existing wells. Owners of 50 or fewer wells were expected to register their wells by February 3, 2009, and complete their well assessment by February 3, 2011. Owners of more than 50 wells were expected to register their wells by February 3, 2011, and complete their well assessment by February 3, 2013.

Regulatory Requirements

For reference, Section S7 and S8 of the NPDES Phase II Permit lists the following requirements for NPDES Phase II permittees:

- Implement the specific requirements identified in Appendix 2 ("Total Maximum Daily Load Requirements") of the NPDES Phase II Permit for applicable TMDLs listed in Appendix 2.
- Compliance with the NPDES Phase II Permit constitutes compliance with applicable TMDLs not listed in Appendix 2 of the NPDES Phase II Permit.
- Comply with NPDES Phase II Permit modifications and TMDL implementation plans prepared by Ecology for TMDLs that are approved by the EPA after the NPDES Phase II Permit has been issued.
- Provide a description of stormwater monitoring or stormwater-related investigations conducted during the reporting period.
- Participate in the Regional Stormwater Monitoring Program (RSMP) or opt-out monitoring. The RSMP includes the following three major components:
  - Status and trends monitoring.
  - Stormwater management program effectiveness studies.
  - Source identification and diagnostic monitoring (SIDM).

Gaps and Recommendations

Table 2 summarizes needs identified in the Stormwater Management Needs Assessment (Sequim 2014) related to water quality compliance. Recommendations are provided for each need identified. Additional gaps were identified in the document review and discussions with the City. Recommendations to address each of these gaps are also provided below.

Table 2. Water Quality Compliance Gaps and Recommendations.			
Topic	**Source**	**Summary of Gap**	**Recommendations**
Pollution control program	Discussion with City staff	Numerous waterbodies in the City are on the 303(d) list of impaired waters (Category 5), but no TMDLs have been initiated.	The City could take action to proactively develop and implement a pollution control program for water bodies currently on the 303(d) list of impaired waters. A pollution control program would include: • Actions to correct the specific pollution problem • Monitoring to evaluate effectiveness • Adaptive management • Enforceable pollution controls or actions stringent enough to attain water quality standards • Description of management measures • Implementation schedule • Description of criteria that are used to determine loading reductions • Education component If the City's pollution control program is accepted by Ecology, the waterbodies may be moved from Category 5 to Category 4b and avoid a TMDL process.
Monitoring	Stormwater Management Needs Assessment (Sequim 2014)	The City should determine what monitoring is needed in order to manage storm flows, prevent stormwater contamination of surface and ground water, and preserve recharge. The City should decide what is needed for this monitoring: equipment, staff resources, which laboratory analyses, which surface water sites and groundwater wells (existing or new), landowner agreements, data management, etc. – and coordinate with other entities conducting or planning to conduct monitoring.	Implement additional water quality monitoring recommendations included in the Water Quality Data Analysis Report: • 12 samples per year (6 during wet weather and 6 during dry weather) at 6 monitoring stations in Bell and Johnson Creek • Continuous monitoring of dissolved oxygen and temperature in Bell Creek during the summer months • Fecal source tracing survey in Bell Creek

Table 2 (continued). Water Quality Compliance Gaps and Recommendations.			
Topic	**Source**	**Summary of Gap**	**Recommendations**
Monitoring	Stormwater Management Needs Assessment (Sequim 2014)	Data collected in the past five years by Clean Water Work Group partners in both Bell and Johnson Creeks (and any irrigation ditches if available) should be evaluated to see if there is a direct relationship for various parameters with stormwater runoff from urban areas. Depending on the results of this evaluation, water quality monitoring should be considered for Bell and Johnson Creeks (at least) and potentially Washington Harbor, Pitship Estuary/Bay and certain irrigation ditches that feed area creeks. Consider accumulation of metals in streambed sediments in Bell Creek as a water quality monitoring plan is developed.	Implement additional water quality monitoring recommendations included in the Water Quality Data Analysis Report.
Monitoring	Stormwater Management Needs Assessment (Sequim 2014)	• The City should monitor streamflow trends in several reaches in Bell and Johnson Creeks above, inside, and below city limits, and consider including Gierin Creek at Brown Road. • Flow trends in irrigation conveyances through the city should also be monitored, especially those that receive substantial stormwater runoff.	Develop and implement flow monitoring program (currently underway).
Groundwater	Stormwater Management Needs Assessment (Sequim 2014)	Persistent nitrate contamination in the shallow aquifer within and around the city limits should be tracked, especially since nitrates are a good indicator that other contaminants may be present.	Develop and implement a nitrate groundwater monitoring plan.

Table 2 (continued). Water Quality Compliance Gaps and Recommendations.

Topic	Source	Summary of Gap	Recommendations
Groundwater	Stormwater Management Needs Assessment (Sequim 2014)	Groundwater should be monitored for pollutants typically found in stormwater runoff upgradient, inside, and downgradient of the city (i.e., metals, hydrocarbons, bacteria, and any chemicals used for or a byproduct of ice/ snow management, weed/ root management, vehicle maintenance, vactor/ sweeper truck waste, etc.)	Develop and implement a groundwater monitoring plan for stormwater constituents of concern.
Groundwater	Stormwater Management Needs Assessment (Sequim 2014)	The City should consider monitoring stormwater and groundwater quality at locations where stormwater facilities and water quality have been monitored in the past, to check long-term performance of the facilities.	Develop and implement a stormwater facility monitoring plan (including private facilities). City requires monitoring for the first 3-5 years (commercial and residential). Consider benefits of continuing this monitoring requirement.
UIC registration	Stormwater Management Needs Assessment (Sequim 2014)	The City needs to identify and register its UIC wells with Ecology as soon as possible, and then complete well assessments.	• Use GIS to identify wells that need to be registered with Ecology. • Use online form to register wells: http://www.ecy.wa.gov/PROgrams/wq/grndwtr/uic/UIConlineregis.html • Complete well assessments per guidance on Ecology's website: http://www.ecy.wa.gov/PROgrams/wq/grndwtr/uic/UICwellassessment.html
Well assessment	Stormwater Management Needs Assessment (Sequim 2014)	• The City should find funding to assess the potential threat to groundwater quality posed by its infiltration facilities. • The City should fund an assessment of whether its underground injection wells (several dozen pre-exist the CARA code) are a threat to groundwater and take mitigative action as necessary to protect the aquifer.	Develop a plan to assess drywells classified as UICs.

Species and Habitat Protection

Current Activities

The City does not currently have a species and habitat protection program, other than membership and participation in the Dungeness River Management Team and Water Management Rule Implementation committees. The following activities have recently been completed that have benefitted species and habitat protection.

- Pitship Estuary Bridge on West Sequim Bay Road that reconnects tidal functions to the Pitship Pocket Estuary.
- Reclaimed water is used north of the Reuse Demonstration Park to irrigate Garry Oaks Park managed by WDFW and to augment ponds that benefit migratory waterfowl.
- Bell Creek flow is continuously augmented year-round with reclaimed water at a rate of 0.1 cfs.

The City also cooperated with the Jamestown S'Klallam Tribe on the Washington Harbor Estuary Bridge project to replace a causeway that supported the City's outfall pipe and blocked potential fish habitat.

The City has identified recommendations for species and habitat protection in the Stormwater Management Needs Assessment (Sequim 2014).

Regulatory Requirements

The US Fish & Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration (NOAA) oversee implementation of the federal Endangered Species Act (ESA). Several local species are ESA listed as endangered or threatened, and recovery plans are underway. While the ESA does not specifically address stormwater management activities, it does prohibit the "taking" of listed species (i.e., killed or harmed – where harm can include habitat or water quality degradation), including a take that could result from the City's stormwater facility operations or private development stormwater management activities that are permitted by the City.

Several federally listed endangered and threatened species are found within the City limits, including fish species and birds that rely on fresh and/or marine water for some portion of their life history and are summarized below in Table 3.

Table 3. Listed Species in the City of Sequim.			
Species	**Status**	**Location**	**Federal Jurisdiction**
Strait of Juan de Fuca bull trout	FT	Dungeness River and associated tributaries, Bell Creek, Johnson Creek	USFWS
Bald eagle	SC, SS	Various nesting sites throughout Sequim, concentrated mostly along Sequim Bay and Dungeness River	USFWS, WDFW
Chinook salmon	FT	Sequim Bay, Dungeness River and associated tributaries	NMFS
Coho salmon	FC	Dungeness River and associated tributaries	NFMS
Marbled murrelet	FE	Forest habitat along streams, rivers, and marine foraging areas	USFWS
Osprey	SM	Nest near Palo Alto	WDFW
Pacific herring	CS	Sequim Bay	WDFW
Puget Sound steelhead trout	FT	Dungeness River and associated tributaries, Bear Creek, Bell Creek, Johnson Creek	NMFS

FE = Federally Endangered
FT = Federally Threatened
FC = Federal Candidate
SC = Species of Concern
SS = State Sensitive
SM = State Monitored
CS = State Candidate
USFWS = United States Fish and Wildlife Service
WDFW = Washington Department of Fish and Wildlife
NMFS = National Marine Fisheries Service

Gaps and Recommendations

The Stormwater Management Needs Assessment (Sequim 2014) also included several other needs for Federal and State fish and wildlife habitat protection. Table 4 summarizes these needs along with recommendations for each need identified.

Table 4. Species and Habitat Protection Gaps and Recommendations.

Topic	Source	Summary of Gap	Recommendations
Fish and wildlife habitat protection	Stormwater Management Needs Assessment (Sequim 2014) and Professional judgment	Federal assessments designate Dungeness River and Bell and Johnson Creeks as "critical habitat" for threatened or endangered salmonids: • Bull trout (critical habitat designated in 2010) • Puget Sound steelhead (critical habitat currently proposed for designation)	• Ensure habitat access by examining all culverts and replacing them if they pose barriers to fish passage. Replace with bridges where possible to allow passage of large woody debris. • Maintain riparian buffers to control water temperature and provide forage material.
Fish and wildlife habitat protection	Stormwater Management Needs Assessment (Sequim 2014)	The City should participate in studying fish use and setting restoration goals for Bell and Johnson Creeks.	The City should participate in Dungeness River Management Team (DRMT) routine meetings and request smolt outmigration data from Bell Creek measured by the Tribe.
Fish and wildlife habitat protection	Professional judgment	Prevent development and expansion in the floodplain to maintain access to off-channel habitat.	• Determine whether the City needs to update floodplain mapping within City limits to be in compliance with the National Floodplain Insurance Program (NFIP) and restrict development within the floodplain. • Utilize soft bank stabilization methods, levee setbacks, and limit the use of riprap and other bank hardening methods to allow natural stream migration and off-channel habitat formation.
Fish and wildlife habitat protection and groundwater	Stormwater Management Needs Assessment (Sequim 2014)	The City should participate in water management, hydrogeologic, aquifer recharge, and modeling studies pertaining to the Dungeness aquifer system, especially as they relate to the City's drinking water supplies and area stream flows.	The City should participate in DRMT routine meetings and with Water Rule implementation groups.

Stormwater Design Guidance and Plan Review

Current Activities

The City implements a variety of activities and programs for stormwater design guidance and plan review that include the following:

- **Stormwater management design guidance:** The SMC requires use of "the latest edition" of Ecology's SWMMWW for designing stormwater systems. The latest edition was published in 2012 and revised in 2014 (Ecology 2012b).
- **Stormwater site plan review:** The City (Senior Planner, Department of Community Development) currently conducts drainage reviews for smaller developments, and contracts out the drainage review for larger developments within the city. The City does not typically use modeling software for plan review of residential projects.
- **LID code update/integration**: In 2009**,** AHBL worked with the City as part of the Low Impact Development (LID) Local Regulation Assistance Project and evaluated the SMC to incorporate and require LID principles and LID best management practices (BMPs) (AHBL 2009). The code recommendations have not yet been adopted. The City code sections that were reviewed and a brief summary of the recommendations are provided below:
  - Title 12- Street, Sidewalks, and Public Places
    - Recommendations included new language to facilitate permeable pavement surfacing for sidewalks and right-of-ways and encourage alternative street design to incorporate LID BMPs
  - Title 13- Public Services (Section 13.108)
    - Minimal revisions were provided since this section already includes provisions for maintaining LID BMPs
  - Title 17- Subdivisions (Sections 17.12, 17.20, 17.24, 17.28, and 17.32)
    - Recommendations included language that requires applicants to perform LID site analysis, discusses native vegetation retention standards, and allows for integration of LID into required landscaping
  - Title 18- Zoning (Section 18.22, 18.24, 18.26, 18.40, 18.44, and 18.48)
    - Recommendations include language that requires LID-focused site analysis for certain projects, specifies new standards for reduction of stormwater volume through a combination of LID BMPs, provides LID-focused performance standards for clearing and grading activities, and adds references to LID engineering standard drawings
- **Stormwater management ordinance and enforceable mechanisms:**
  - SMC 13.104.100 currently adopts the most recent version of Ecology's SWMMWW.
- **Recordkeeping and enforcement:**
  - As-built drawings are kept on file with the City.
  - The City has established the authority to enforce the stormwater management ordinance and issue a stop work order if needed (SMC 13.104.390).

Regulatory Requirements

For reference, Section S5.C.4.a-g of the NPDES Phase II Permit lists the following requirements:

- Implement an ordinance or ordinance revisions that addresses runoff from new development, redevelopment, and construction site projects.
- Review all stormwater site plans for proposed development activities.
- Train City staff responsible for implementing the program described above, including staff involved with permitting, plan review, construction site inspections, and enforcement.
- Review and revise local development-related codes, rules, standards, and other enforceable documents to incorporate and require LID principles and LID BMPs.
- Summarize the results of the code review and revision process in a report to Ecology.
- Participate in watershed-scale stormwater planning (not applicable to the City since it is not located in the same watershed as a Phase I jurisdiction).

Gaps and Recommendations

Table 5 summarizes gaps identified in the Stormwater Management Needs Assessment (Sequim 2014) related to stormwater design guidance and plan review. Additional gaps were identified in the document review and discussions with the City. Recommendations to address each of these gaps are also provided below.

Table 5. Stormwater Design Guidance and Plan Review Gaps and Recommendations.

Topic	Source	Summary of Gap	Recommendations
Stormwater management guidance	Stormwater Management Needs Assessment (Sequim 2014)	Sequim should consider alternatives to the Ecology SWMMWW based on local conditions.	• Review the 2012 SWMMWW and 2014 modifications. • Consider developing an amendment to the 2012 SWMMWW that provides guidelines and requirements specific to the City (i.e., storage of deicing material, runoff rates specific to the City, the best infiltration BMPs for the City, etc.).
Stormwater management guidance	Stormwater Management Needs Assessment (Sequim 2014)	The City should develop a master plan that identifies BMPs that are most effective at protecting groundwater quality while preserving recharge.	Research which BMPs are most effective in protecting groundwater quality while preserving recharge as part of the Master Plan and consider including these BMPs in an additional guidance document or amendment to the 2012 SWMMWW.
Stormwater management guidance	Stormwater Management Needs Assessment (Sequim 2014)	Application of the SWMMWW for single family vs. larger development projects should be clarified.	Develop handouts that summarize on-site stormwater management, treatment, and flow control thresholds for single-family and commercial development projects. Update the SMC as needed.

Table 5 (continued). Stormwater Design Guidance and Plan Review Gaps and Recommendations.			
Topic	**Source**	**Summary of Gap**	**Recommendations**
Stormwater design	Professional judgment	The City should consider promoting secondary uses of stormwater.	Consider promoting or incentivizing secondary uses for stormwater such as rainwater collection and reuse for irrigation and toilet flushing.
LID code update/integration and summary report	Stormwater Management Needs Assessment (Sequim 2014)	The City should consider AHBL's recommendations and summary report and evaluate additional chapters of the SMC that are pertinent to stormwater management.	• Incorporate some or all of AHBL's recommendations into the SMC • Review the following additional sections of the SMC to determine if additional edits are needed: o 8.36- Flood Damage Prevention o 13.40- Sewer Connection Required o 13.48- Public Sewer Use Regulations o 13.64- Storm Drainage o 13.104- Stormwater Management o 15.04.101- IBC Appendix J o 18.80- Critical and Environmentally Sensitive Areas Protection • Develop a brief summary report that highlights the proposed amendments to the SMC • Coordinate with City Council to review and approve proposed changes to SMC
Stormwater site plan review and staff training	Workshop, NPDES Phase II Permit	Stormwater site plan review currently does not have a consistent review process or checklists and tools to support plan review under the SWMMWW. The City does not currently have a training program for site plan review and inspection staff.	• Develop a consistent stormwater plan review process. • Develop checklists and sizing table tools for site plan review to increase efficiency. • Develop specific plant lists for BMPs. • Training for staff is recommended when updates occur to planning, development, inspection, and enforcement of stormwater runoff controls. • Promote upcoming training opportunities for designers (specifically on the 2012 SWMMWW). • Coordinate with the Clallam Conservation District for other training opportunities for staff (i.e., rain garden training).
Basin Planning	NPDES Phase II Permit	The City is not involved in a watershed- scale stormwater planning process	The City is not an NPDES Phase II Permittee and is not required to participate in watershed-scale stormwater planning, but should look for opportunities to partner with Clallam County in a watershed-scale planning effort.

Asset Management

Current Activities

The City currently does not have an asset management program for stormwater infrastructure, but has mapped the majority of its stormwater facilities and structures in geographic information system (GIS).

Regulatory Requirements

There are no regulatory requirements for an asset management program.

Gaps and Recommendations

An effective asset management program ensures that assets continue to function over the long term and significantly reduces the potential for system failure. Asset management is a system for maintaining the desired level of service while minimizing the life cycle cost of stormwater assets. An asset management program typically includes an inventory of assets, an assessment of their condition, implementation of a GIS-based asset management data information tracking system, and prioritization of maintenance or capital repair projects based on assessing the likelihood of failure and consequences of failure for each asset.

It is recommended that the City begin an asset management program by implementing an asset inventory and updating stormwater system components in GIS with current conditions. This inventory could be conducted with camera equipment that could also be used for Pollution Source Detection and Elimination and Stormwater System O&M, and could happen concurrently with the recordkeeping recommendation in the Stormwater System O&M section to update and record inspection maintenance activities of stormwater assets in GIS.

Table 6 summarizes gaps identified during discussions with the City. Recommendations to address each of these gaps are also provided below.

Table 6. Asset Management Gaps and Recommendations.

Topic	Source	Summary of Gap	Recommendations
Pollution Source Detection program	Stormwater Management Needs Assessment (Sequim 2014)	The City should have a program for actively identifying pollution sources.	Develop and implement a pollution source tracking program (other programs developed by NPDES Phase II permittees can be used as guidance).
Storm system map (GIS) updates	Stormwater Management Needs Assessment (Sequim 2014)	The City's GIS for storm system components needs to be updated and maintained.	• Continue to update the storm system map and database as needed. • Major parking lots and subdivisions should be included in GIS. • WSDOT facilities installed for SR 101 should be included in GIS. • Develop a system to ensure that new development projects with stormwater components are incorporated into GIS.
Asset Management	Workshop	City does not have an asset management program	Improve the existing asset management by updating stormwater system components in GIS with current conditions

Stormwater System Operations and Maintenance

Current Activities

The City currently implements a variety of stormwater system operations and maintenance (O&M) activities that include the following:

- **Inspections and O&M program:**
  - City-owned catch basin and stormwater facilities (e.g., drywells and perforated pipes) inspection and cleaning every 1 to 3 years, according to need
  - Street sweeping, most streets several times/year
  - Stormwater facility cleaning and maintenance, repair/replacement as needed
  - Flooding response and repair
- **Spill Response:**
  - Spill control materials (i.e., sand bags, kitty litter, straw wattles, catch basin filters, etc.) are kept on hand in case of spills, including firefighting water.

The Streets crews also implement the following activities which may impact stormwater:

- **Snow and Ice Management:** Crews have used magnesium chloride since the winter of 2011-2012 as a de-icing agent on main arterials, overpasses, hills, and roundabouts. Magnesium chloride has been more cost-effective for the City than road salt or sand and is more environmentally friendly than most other de-icers. The use of magnesium chloride also does not require additional street sweeping (as required with sand) to pick up material after each storm event. De-icing materials are stored outdoors in storage tanks (8,000 gallon maximum capacity) on an uncovered impervious area.
- **Weed Management:** City crews occasionally use EPA-approved herbicides during the summer and early fall to keep sidewalks and street gutters free of weeds. Any herbicides used are applied to the minimum extent practicable and are applied by Washington State Department of Agriculture Pesticide licensed Public Works crew members. Herbicides are stored in the breezeway in containers or inside on a concrete pad. The City does not currently have an Integrated Pest Management Plan (IPMP).
- **Vactor Waste Disposal:** The City collects vactor waste from cleaning and maintenance of catch basins, detention facilities, and treatment structures or facilities. The vactor waste is transported to the City Shop facility and dumped at the decant facility. The decant liquids are sent to the sanitary sewer system. Clean solids are disposed of at the County gravel pit or land-applied to City-owned property next to the Shop. If a hot load is suspected, materials are tested prior to dumping and transported to the Port Angeles Landfill.
- **Street Sweeping Waste Disposal:** Street sweeping waste is transported to the City Shop facility and dumped on a dewatering slab where the liquids are decanted from the solids. The decant liquids are sent to the sanitary sewer system. Clean solids are disposed of at the County gravel pit or land-applied to City-owned property next to the Shop. If a hot load is suspected, materials are tested prior to dumping and transported to the Port Angeles Landfill.

Regulatory Requirements

SMC 13.108.080 adopts stormwater facility maintenance standards per the Ecology SWMMWW. To be consistent with City code, the City should implement the maintenance standards included in the SWMMWW. The Ecology SWMMWW contains maintenance standards for the following types of facilities:

- Infiltration facilities (infiltration basins and infiltration trenches)
- Detention facilities (detention ponds, detention tanks, detention vaults and control structures)
- Wet pool facilities (wet ponds, wet vaults, stormwater treatment wetlands, combined detention and wetpool facilities)
- Biofiltration facilities (biofiltration swales, wet biofiltration swales)
- Filters (sand filters, media filters, filter strips, media filter drains, and compost amended vegetated filter strips)
- On-Site Stormwater Management BMPs (or LID BMPs) (bioretention, permeable pavement, rain gardens, and vegetated roofs)
- General stormwater system components (catch basins, debris barriers, and energy dissipaters)
- Oil water separators

SMC 13.108.090 specifies minimum maintenance standards for the following stormwater facilities.

- Facilities: Inspect annually, clear debris, sediment and vegetation if affecting the function and/or design capacity of the facilities
- Grassy swales and biofilters: Monthly inspection of, mow or replant as necessary and proper dispose of clippings

SMC 13.108.100 requires disposal of waste from maintenance activities to comply with the minimum Functional Standards for Solid Waste Handling (Chapter 173-304 WAC) and, where appropriate, the Dangerous Waste Regulations (Chapter 173-030 WAC).

For reference, Section S5.C.5.a-f of the NPDES Phase II Permit lists the following requirements:

- Implement maintenance standards that are as protective or more protective of facility function than those specified in Ecology's SWMMWW
- Inspect municipally owned or operated permanent stormwater treatment and flow control BMPs/facilities (other than catch basins) annually and take appropriate maintenance actions
- Conduct spot checks of potentially damaged permanent treatment and flow control BMPs/facilities (other than catch basins) after major storm events

- Perform maintenance of public stormwater facilities within the NPDES Phase II Permit-specified timeframes
- Conduct catch basin and inlet inspections on a routine basis using one of three options outlined in the NPDES Phase II Permit
- Implement practices, policies, and procedures to reduce stormwater impacts associated with runoff from all lands owned or maintained by the City and road maintenance activities under the functional control of the City
- Implement an ongoing training program for City employees whose primary construction, operations, or maintenance job functions may impact stormwater quality
- Implement a Stormwater Pollution Prevention Plan (SWPPP) for all heavy equipment maintenance or storage yards and material storage facilities owned or operated by the City
- Maintain records of inspections and maintenance or repair activities

Gaps and Recommendations

Table 7 summarizes gaps identified in the Stormwater Management Needs Assessment (Sequim 2014) related to stormwater system O&M. Additional gaps were identified in the document review and discussions with the City. Recommendations to address each of these gaps are also provided below.

Table 7. Stormwater System Operations and Maintenance Gaps and Recommendations.

Topic	Source	Summary of Gap	Recommendations
General O&M program	Stormwater Management Needs Assessment (Sequim 2014)	Street sweeping coverage is good but the routine should be evaluated to ensure adequate infrastructure protection and pollutant removal.	Evaluate street sweeping routine to determine if changes need to be made.
General O&M program	Stormwater Management Needs Assessment (Sequim 2014) and workshop	Agreements regarding the type and frequency of maintenance should be established with irrigators and other stormwater management partners, including the County and WSDOT, as needed.	Establish maintenance agreements with irrigators and other stormwater management partners addressing type and frequency of maintenance activities as well as responsibilities for maintenance.

Table 7 (continued). Stormwater System Operations and Maintenance Gaps and Recommendations.			
Topic	**Source**	**Summary of Gap**	**Recommendations**
General O&M program	Stormwater Management Needs Assessment (Sequim 2014)	A policy should be adopted to avoid unnecessary inheritance of facilities that add to the City's maintenance and repair obligations.	Develop a policy for City inheritance of private stormwater facilities that specifies the condition that a private stormwater facility should be in prior to being inherited by the City. Consider coordinating this policy with the inheritance of private streets. Options for the City include: 1. Inspect facilities and require that the property owner hire a qualified contractor to conduct necessary maintenance 2. Require facility owners to contract with a third party inspector and provide an inspection certification letter to the City, as well as proof that any required maintenance has been completed 3. Perform maintenance and charge the property owner 4. Assume maintenance responsibilities through a deed or easement.
General O&M program	Stormwater Management Needs Assessment (Sequim 2014)	The potential for improved internal communications within Public Works to facilitate improvements in O&M activities should be explored, especially as O&M activities increase.	Improve internal communications within Public Works to facilitate O&M activities. Consider developing a Public Works flow chart or internal communications plan.
General O&M program	Workshop	It has been 2-5 years since the Shop stormwater pond was last maintained.	Include the stormwater pond that drains the south end of the Shop parking lot in regular inspection and maintenance routines.
Recordkeeping	Stormwater Management Needs Assessment (Sequim 2014)	The GIS database (and/or other programs) should be used to document inspection and maintenance activities.	Add maintenance and inspection information to the storm system map and database in GIS.
Stormwater policies and procedures	Stormwater Management Needs Assessment (Sequim 2014)	The City should assess whether weed management practices are contaminating stormwater runoff.	The City should develop an Integrated Pest Management Plan (IPMP) for right-of-way vegetation and stormwater facility maintenance.
Stormwater policies and procedures	Stormwater Management Needs Assessment (Sequim 2014)	Trash and litter accumulate in certain problem areas.	Remove trash and litter from problem areas, set up a notification system and response, or implement a volunteer program for service days.

Table 7 (continued). Stormwater System Operations and Maintenance Gaps and Recommendations.			
Topic	**Source**	**Summary of Gap**	**Recommendations**
Stormwater policies and procedures	NPDES Phase II Permit	The City does not currently have written standard operating procedures (SOPs) for O&M activities for preventing stormwater pollution outside of City-owned facilities.	Develop SOPs for O&M staff. SOPs may include: • Ditch maintenance • Street cleaning • Utility installation • Sediment and erosion control • Dust control • Application of fertilizers, pesticides, and herbicides • Trash and pet waste management • Deicing methods
SWPPPs	NPDES Phase II Permit	The City Shop currently does not have a SWPPP.	Review SWPPPs developed for other Cities and Counties to determine if a similar plan should be developed for the City Shop.
Staff training	NPDES Phase II Permit	The City does not currently have a stormwater O&M staff training program.	• Require City O&M staff attendance at trainings, especially those related to maintenance of LID BMPs. • Invite vendors to present on how to maintain their technologies, and encourage City O&M staff to attend training. • Invite Irrigation District and Clallam County • O&M staff to attend trainings.
O&M staffing	Stormwater Management Needs Assessment (Sequim 2014)	The City currently does not have sufficient staff support for performing catch basin inspections.	Consider hiring seasonal workers during the fall to work on inspection/maintenance crew.
O&M staffing	Workshop	The City currently does not have sufficient staff support for inspecting and cleaning stormwater pipes and drywells.	Increase staff support for inspecting and cleaning stormwater facilities.
O&M equipment	Professional judgment	The City should budget for equipment for maintaining LID BMPs if these types of facilities are expected to be more prevalent in the future.	Obtain additional tools and equipment to inspect, maintain, and repair LID facilities.

Pollution Source Detection and Elimination

Current Activities

Pollution Source Detection and Elimination refers to the detection and elimination of "illicit discharges", defined in SMC 13.104.040 as non-stormwater discharges to the storm drainage system that cause or contribute to a violation of state water quality, sediment quality or ground water quality standards. These discharges can include, but are not limited sanitary sewer connections, industrial process water, interior floor drains, car washing, and greywater systems. The City's activities related to pollution source identification and elimination include the following:

- **Stormwater system map updates:** Ongoing mapping of the City's stormwater facilities and pipes (both City and non-City owned) is described under Asset Management.
- **Illicit discharge ordinance:** Adopted an illicit discharge ordinance prohibiting illicit discharges to stormwater drainage systems (SMC 13.104.120).
- **Enforcement:** Ecology and the EPA have enforced several past illicit discharges within the city.

Regulatory Requirements

SMC 13.104.120 prohibits illicit discharges to stormwater drainage system.

For reference, Section S5.C.3.a-f of the NPDES Phase II Permit lists the following requirements related to pollution source identification and elimination (known as "Illicit Discharge Detection and Elimination" or "IDDE" in the NPDES Phase II Permit) for NPDES Phase II permittees:

- Map stormwater outfalls, receiving waters, City-owned stormwater facilities, and geographic areas that do not discharge stormwater to surface waters
- Develop and implement an illicit discharge ordinance
- Implement an ongoing program to detect and identify non-stormwater discharges and illicit connections
- Implement a field screening methodology to detect and identify non-stormwater discharges and illicit connections into the stormwater drainage system (i.e., roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, storm drains, and outfalls)
- Inform public employees, businesses, and the general public of the hazards associated with illicit discharges and improper disposal of waste
- Ongoing training program for all municipal field staff

Gaps and Recommendations

Table 8 summarizes gaps identified in the Stormwater Management Needs Assessment (Sequim 2014) related to the City's Pollution Source Detection and Elimination Program. Additional gaps were identified in the document review and discussions with the City. Recommendations to address each of these gaps are also provided below.

Table 8. Pollution Source Detection and Elimination Gaps and Recommendations.

Topic	Source	Summary of Gap	Recommendations
Illicit discharge hotline	NPDES Phase II Permit	The City currently does not have a spill reporting hotline.	• Develop a spill reporting hotline or web form and promote on the City's main webpage and at public events. • Consider partnering with the City of Forks and Port Angeles, Clallam County, and tribes or regional agencies to establish a regional spill reporting hotline and website.
Illicit discharge ordinance	NPDES Phase II Permit	The City's existing illicit discharge ordinance could use some minor improvements.	Update illicit discharge ordinance with a list of prohibited and allowable discharges and enforcement procedures, or provide policy direction for interpreting it.
Pollution source field screening	NPDES Phase II Permit	The City does not currently have a pollution source field screening program to screen the storm drainage system for pollutants, conduct indicator sampling, and implement follow-up source tracing to pinpoint the pollution source.	• Develop and implement a field screening program for the City's stormwater system. • Obtain field equipment that can be used for pollution source field screening and source tracing (see Equipment Recommendations section). • Develop a basic training program for City field staff (see Staff training below). • Develop a system for tracking all illicit discharges reported and investigated (see Recordkeeping below).
Pollution source education	NPDES Phase II Permit	Educational materials for pollution source prevention and response are not currently available.	Provide pollution source prevention and response education as part of the City's ongoing public education program to the general public and businesses.
Staff training	NPDES Phase II Permit	The City does not currently have a pollution source identification and elimination training program.	• Develop a basic training program for City field staff that covers what visual cues and odors can be used to identify an illicit discharge or illicit connection and who they should report this to. • Require staff involved in illicit discharge response to review the Illicit Connection/Illicit Discharge Field Screening and Source Tracing Guidance Manual that was developed for the State of Washington (Ecology 2013): <www.wastormwatercenter.org/illicit-connection-illicit-discharge>.
Recordkeeping	NPDES Phase II Permit	The City does not currently track pollution sources or spills.	Develop a system for tracking all pollution sources and spills reported and investigated.

Public Education and Involvement

Current Activities

The City's stormwater public education and involvement currently includes the following activities, all directly related to the 2013-2015 Master Plan project, partially funded by a Centennial Clean Water grant from Ecology:

- **Education:**
  - Dungeness River Fest (September 2014)
  - Interpretive Center at Water Reuse Demonstration Park (grand opening in October 2014; open 2 hours every Wednesday mornings and Thursday afternoon)
  - Public presentations to Chamber of Commerce, Dungeness River Management Team, Science Café, Sequim Assoc. of Realtors, North Peninsula Builders Assoc., and others
  - Stormwater Stewardship flyer, Bell Creek poster, LID resource table and other elements displayed at the Interpretive Center
  - Website on surface water management, including a page on the Stormwater Stewardship project, and a virtual tour of local water resources
  - Creek sign installation (Bell, Johnson, Gierin Creeks)
- **Opportunities for public involvement:**
  - Website for the Stormwater Management Needs Assessment (Sequim 2014) project to solicit reports of flooding and problem areas within the City
  - Volunteer program, including storm drain inventory, flow monitoring, data entry, watershed education, and other activities
  - Bell Creek Discovery Tour online or on-the-ground educational tour of sites from headwaters to mouth (prizes for those completing tour April-May 2015)
  - Monthly Stormwater Stewardship project updates offered by email to subscribers via website
- **Coordination with stakeholders:** Directly consults with stakeholder groups (e.g., irrigators, Clallam County, homeowner groups, tribes) regarding stormwater management and water quality

Regulatory Requirements

There are no regulatory requirements for public education and involvement regarding stormwater or water quality currently applicable to the City of Sequim.

The Elwha-Dungeness Watershed Plan (Elwha-Dungeness Planning Unit 2005) recommends the following actions:

- Develop a central clearinghouse for all conservation and environmental outreach work within the watershed (WRIA 18)
- Work with WRIA 18 schools districts, nonprofit organizations, and local jurisdictions to develop educational curricula, continuing education for professionals, and public outreach for general adult education
- Provide information on services and resources for landowners in watershed resource management (e.g., WSU Cooperative Extension, Clallam County Conservation District, and Clallam County resources)
- Encourage citizen involvement for ongoing planning efforts at local and regional levels
- Encourage landowners to protect sensitive areas through donated or purchased conservation easements
- Support efforts to involve the community in planning and efforts to preserve, restore, and protect the watershed
- Educate landowners in the watershed and along the shoreline on the importance of providing functional salmon habitat
- Encourage the Sequim school districts to collaborate with the Dungeness River Audubon Center to and seek funding for school programs that include more "hands on" activities for the following topics:
    - Riparian function
    - Watershed issues
    - River processes
    - Water resources conservation
- Encourage the City to collaborate with Clallam County and the Tribes to identify resources for establishing cooperative programs involving organizations such as the Olympic National Park, City of Port Angeles, Clallam County, and Clallam Conservation District
- Develop interpretive signage and handouts for use by neighborhood and river and creek watch groups
- Continue water quality education and outreach:
    - Develop effective modes of communication (e.g., newsletters, flyers, radio, fairs/festivals) on subjects such as non-point pollution concerns, pasture management, septic systems, shellfish, proper use of well water, application of pesticides, septic systems, etc.
    - Conduct pre and post surveys to evaluate effectiveness of educational efforts
    - Provide BMP information to landowners
- Educate riverside and marine shoreline landowners on importance of habitat management planning

For reference, Section S5.C.1.a-c and Section S5.C.2.a-b of the NPDES Phase II Permit lists the following requirements for NPDES Phase II permittees:

- Provide an education and outreach program targeting the following audiences:
  - General public (including school age children)
  - Businesses (including home-based and mobile businesses)
  - Engineers, contractors, developers, and land use planners
  - Residents, landscapers, and property managers/owners
- Potential subject areas for the education and outreach program include the following:
  - General public and 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 best management practices (BMPs)
    - Opportunities to become involved in stewardship activities
    - Use and storage of automotive chemicals, hazardous cleaning supplies, carwash soaps, and other hazardous materials
    - Equipment maintenance
    - Prevention of illicit discharges
  - Engineers, contractors, developers, and land use planners:
    - Technical standards for stormwater site and erosion control plans
    - LID principles and BMPs
    - Stormwater treatment and flow control BMPs/facilities
  - Residents, landscapers, and property managers/owners:
    - Yard care techniques protective of water quality
    - Use and storage of pesticides and fertilizers and other household chemicals
    - Vehicle, equipment and home/building maintenance
    - Pet-waste management and disposal
    - LID principles and LID BMPs
    - Stormwater facility maintenance
    - Dumpster and trash compactor maintenance
- 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.

- Measure the understanding and adoption of targeted behaviors for at least one target audience in at least one subject area.
- Use results to direct education and outreach resources most effectively as well as to evaluate changes in adoption of targeted behaviors.
- Create opportunities for the public to participate in the decision-making processes involving the development, implementation, and update of the Stormwater Management Program (SWMP).
- Post the SWMP Plan and annual report on the City's website.

Gaps and Recommendations

Improvements and expansion of the City's public education and involvement is a valuable investment, as public education is one of the most effective means of preventing stormwater pollution. Table 9 summarizes gaps identified in the Stormwater Management Needs Assessment (Sequim 2014) related to public education and outreach. Additional gaps were identified in the document review and discussions with the City. Recommendations to address each of these gaps are also provided below.

Table 9. Public Education and Involvement Gaps and Recommendations.

Topic	Source	Summary of Gap	Recommendations
Stormwater management communication guidance	Stormwater Management Needs Assessment (Sequim 2014)	Strategic communications planning around stormwater management is needed, with components for education, outreach, and public involvement.	Develop a long-term Communications Plan that includes public education and outreach and public involvement components.
Stormwater management guidance	Stormwater Management Needs Assessment (Sequim 2014)	The City should assess the degree to which outreach, education, and citizen participation are underutilized tools that would have significant environmental benefits helping the City reach its stewardship goals.	Evaluate the costs and benefits of having a stormwater public education and outreach program.
Develop new educational materials	Workshop	Educational materials are needed to support developers and builders.	• Provide additional guidance (e.g., factsheets or brochures) for developers and builders on meeting the City's stormwater facility maintenance and construction requirements. • Develop tools (e.g., checklists or handouts) to assist developers and builders with stormwater drainage design.

Table 9 (continued). Public Education and Involvement Gaps and Recommendations.

Topic	Source	Summary of Gap	Recommendations
Develop new educational materials	Workshop (with topics from the NPDES Phase II Permit)	Educational materials are needed for the general public and businesses.	Develop outreach materials on the following topics: • General impacts of stormwater on surface waters and groundwater • Impacts from impervious surfaces • Impacts of illicit discharges and how to report them • LID principles and LID BMPs • Opportunities to become involved in stewardship activities • City regulations on inspections • O&M for all types of stormwater facilities
Develop new educational materials	Workshop (with topics from the NPDES Phase II Permit)	Educational materials are needed for residents, landscapers, and property managers/owners.	Develop outreach materials on the following topics: • Yard care techniques • Use and storage of pesticides and fertilizers and other household chemicals • Carpet cleaning and auto repair and maintenance • Vehicle, equipment and home/building maintenance • LID principles and LID BMPs • Pet-waste management and disposal • Dumpster and trash compactor maintenance
Stewardship activities	Workshop	A few storm drains were stenciled several years ago, but no current storm drain marking program exists.	Reestablish storm drain marking program using storm drain markers, artwork, or stencils to involve the public and increase stormwater awareness.
Measure the understanding and adoption of target behaviors	NPDES Phase II Permit	It is important to evaluate whether target behaviors are being adopted.	Measure adoption of targeted behaviors (e.g., through survey techniques) and adapt program to best meet goals

Table 9 (continued). Public Education and Involvement Gaps and Recommendations.

Topic	Source	Summary of Gap	Recommendations
Regional program coordination	Stormwater Management Needs Assessment (Sequim 2014)	The City needs to improve coordination with other entities that conduct water quality outreach, provide regional or statewide information, and/or that manage stormwater.	• Participate in regional forums such as the West Sound Stormwater Managers' Coordination Group and the Clallam County Stormwater Work Group • Coordinate with Clallam County Streamkeepers regarding future monitoring efforts • Coordinate with the Association of Washington Cities (AWC) to anticipate what the EPA will require from NPDES Phase II permittees.
Public engagement	Stormwater Management Needs Assessment (Sequim 2014)	The City should identify ways to effectively engage the public, stakeholders, and partners through strategic planning.	Develop a Communications Plan that includes ways to engage the public, stakeholders, and partners through strategic planning.
Public participation	Stormwater Management Needs Assessment (Sequim 2014)	Regular opportunities for public participation should be sought throughout Storm and Surface Water Master Plan development, implementation, and update(s).	Identify opportunities for public participation throughout master plan development, implementation and update.
Stormwater Manager outreach	Stormwater Management Needs Assessment (Sequim 2014)	The City should determine how to best engage in water management discussions with partners and what agreements might be necessary, and pursue those agreements.	• Attend regional conferences and meetings on stormwater and surface water management. • Determine what agreements with other parties may be necessary to achieve stormwater management goals. • Pursue agreements as needed.
Stormwater hotline	Professional judgment	The City does not currently have a general stormwater hotline.	Create a stormwater hotline for public residents to call in general stormwater-related complaints (e.g., drainage problems, construction site runoff). Develop a system for logging and responding to stormwater complaints.

STAFFING, EQUIPMENT, AND RESOURCES

Staffing, equipment, and resources also affect the implementation of the City's stormwater program. The following sections highlight stormwater-related staffing, equipment, and resource issues associated with stormwater program implementation. This section is organized into the following categories:

- Staffing
- Equipment and Facilities
- Funding

STAFFING

When this gap analysis was developed (mid-2015), the City had 1.75 full time equivalent (FTE) personnel designated to supporting stormwater activities (Table 10): 0.75 FTE Operations and 1.0 FTE Capital (currently a temporary position). Three tiers of staffing support were evaluated for future staffing:

A. Needed to meet minimum standards

B. Likely to be mandated

C. Proactively anticipating and reducing risk

Table 10. City of Sequim Stormwater Program Staff Support.				
	Full Time Equivalent (FTE) Staff			
		Estimated Staff Support Needed		
Position	Designated Staff (mid-2015)	A	B	C
Streets Manager	0.05	0.05	0.05	0.05
Maintenance Worker	0.70[a]	2.09	2.86	2.86
Water Resources Project Manager	1.0	0	0.11	0.23
Stormwater Inspector	0	0.17	0.17	0.17
Water Quality Compliance	0	0.20	0.27	0.29
Stormwater Plan Reviewer	0	0	0.23	0.27
Public Education Coordinator	0	0	0.24	0.29
Total	**0.75 Operations + 1 Capital (temporary position)**	**2.51**	**3.93**	**4.16**

[a] Includes three maintenance workers (25%, 25%, and 20% FTE).

A: Needed to meet minimum standards (includes Inspection Program [high priority], Water Quality Compliance [high priority], and Stormwater System O&M [high priority]).

B: Likely to be mandated (includes Tier A staffing plus Water Quality Compliance [medium priority], Asset Management [medium priority], Stormwater System O&M [medium priority], Pollution Source Detection and Elimination [high priority], Stormwater Design and Plan Review [high and medium priority], and Public Education and Involvement [high priority]).

C: Proactively anticipating and reducing risk (includes Tier B staffing plus Water Quality Compliance [low priority], Species and Habitat Protection [high priority], Stormwater Design and Plan Review [high, medium, and low priority], Pollution Source Detection and Elimination [medium priority], and Public Education and Involvement [medium and low priority]).

EQUIPMENT AND FACILITIES

The primary City equipment currently used for the stormwater program includes two vactor trucks (one new in Fall 2014), a street sweeper, a motorized camera, a "push" camera, and equipment that is used for jetting infiltration lines (Table 11). Additional equipment that could be useful for maintenance, asset management, and pollution source detection inspections include the following:

- Pollution source field screening and source tracing equipment
- Bioretention maintenance equipment
- Permeable pavement maintenance equipment
- Tablets for asset management field data collection

Three tiers were evaluated for future equipment needs:

A. Needed to meet minimum standards

B. Likely to be mandated

C. Proactively anticipating and reducing risk

Table 11. City of Sequim Stormwater Program Equipment.					
Equipment	Current Equipment Tally	New Equipment Cost	Estimated Additional Equipment Needed		
			A	B	C
Vactor truck	2	NA	NA	NA	NA
Street sweeper	1	NA	NA	NA	NA
Jetting equipment	1	NA	NA	NA	NA
Jet and camera (motorized and push camera)	2	NA	NA	NA	NA
Tablet for field data collection and charging cables/docking stations	0	$6,000 (total cost includes 2 tablets and associated equipment)	NA	2 of each	2 of each
Pollution source field screening and source tracing equipment (Herrera 2013): • High powered lamps or flashlights with batteries • Mirror and pole • Dye testing supplies • Sand bags • Smoke testing equipment • Ammonia test strips • pH probe (with temperature probe) • Turbidity meter • Surfactant test kit • Potassium meter • Nitrile gloves • Claw grabber • Swing sampler • Laboratory grade cleaning wipes • Wash bottle • Sample bottles	0	$6,000	0	1 of each	1 of each
Bioretention maintenance equipment: • Mini excavator • Soil monitoring equipment (T-handle core sampler, soil auger, soil nutrient test kit)	0	$36,000	0	0	1 of each
Permeable pavement maintenance equipment: • Small, drivable parking lot sweeper/vacuum cleaning system • Infiltration testing equipment	0	$230,000	0	0	1 of each
Total	**$278,000**				

NA: Not applicable

Note: Additional research is needed for the asset management software, so that cost is not included in this table.

A: Needed to meet minimum standards.

B: Likely to be mandated.

C: Proactively anticipating and reducing risk.

FUNDING

The City currently funds operational (programmatic) stormwater activities (primarily street sweeping and catch basin cleaning) with Water and Sewer Utility funds. The state allows Sewer funds to be used for Stormwater activities. The 2013 and 2014 budgets for stormwater operations were each $101,000 (Table 12). The 2014 budget for stormwater was $251,000, but included grant funding that will extend into 2016.

Table 12. City of Sequim Stormwater Program Funding.

Activity	2013	2014
Operations and Maintenance	$101,000	$101,000
Capital (Planning) Activities[a]	$40,000	$150,000[b]
Total	**$141,000**	**$251,000**

[a] See Master Plan for additional details

[b] $75,000 for 1 FTE + $75,000 for consultant expenses

Other items to consider for future stormwater program funding that were summarized in the Stormwater Management Needs Assessment (Sequim 2014) include the following:

- The City needs to address the inequity among landowners in paying for their stormwater facility maintenance
- The City needs a funding strategy for operational activities that should not rely on grants and development fees
- Budget analysis and forecasting
  - Setting rates/rate structure (if a new Utility were to be chosen)
  - Credits and exemptions, if any
  - Incentives

RECOMMENDED PROGRAM IMPROVEMENTS

This section includes proposed priority, additional staffing support needed, and approximate additional funding needed for each of the recommended activities described above. The additional funding needs summarized in each subsection below include estimated costs for external support and equipment purchases, but do not include funding for any additional City staff support identified. The proposed priority was determined based on City input and professional judgment of risk associated with no action versus the potential benefit of implementing the recommendation. For the Master Plan, the high, medium, and low priorities for each stormwater program element will be sorted into the three tiers (A, B, and C) outlined in the Staffing, Equipment, and Resources section of this report.

CAPITAL FACILITIES

Capital facility improvements will be prioritized in the Known Stormwater Problems and Recommended Solutions section of the Master Plan.

Currently, City staff do not spend a substantial amount of time on stormwater capital facilities. No additional staff or funding are anticipated for the recommended activities summarized below.

Recommendation	Prioritization		Additional Funding Needs	Additional Staff Support (hours/year)
	H/M/L	Justification		
Prioritize and develop conceptual designs for 10 capital facility improvements in the Master Plan.	H	Capital facilities projects are an integral part of the Master Plan.	Included in the Master Plan	0

INSPECTION PROGRAM

Currently, no City staff are dedicated to implementing the stormwater requirements in the City's code for conducting stormwater construction inspections, and post-construction inspections for new development, redevelopment, and construction sites. A total of 0.17 FTE additional staff are anticipated for the recommended activities summarized below.

Recommendation	Prioritization		Additional Funding Needs	Additional Staff Support (hours/year)
	H/M/L	Justification		
Institute a stormwater facility inspection program and develop maintenance standards for non-City-owned stormwater facilities (drains, drywells, infiltration lines, retention/detention ponds, etc.). Develop inspection logs and Plat language, and consider providing owner education. Maintain records of private stormwater facility as-builts, covenants, and inspection logs.	H	Instituting a facility inspection program is required by the SMC. The City does not currently track private facility maintenance or know what standards these facilities are maintained to. Providing guidance, education, and a formal program will help facility owners take ownership of their facilities and keep the City in compliance with the SMC.	$0	120
Improve coordination with homeowner associations, commercial landowners, and School Districts on shared maintenance responsibilities.	H	Maintenance of private stormwater facilities by the owner or private entity is required by the SMC. Coordination with homeowner associations and commercial landowners on shared responsibilities will alleviate maintenance and flooding issues in stormwater ditches and culverts. The City has had to assist the School District with catch basin maintenance, which takes up City time and resources.	$0	100
Develop enforcement procedures for private stormwater maintenance, such as notification letters, required maintenance standards, maintenance tracking procedures, and a restitution process.	M	Per the SMC, the director has the authority to enforce maintenance of private facilities. However, the City should focus efforts on developing private facility inspection program and providing maintenance standards and educational materials to private facility owners before focusing on enforcement program.	$0	80
Total			**$0**	**300 hours (0. 17 FTE)**

WATER QUALITY COMPLIANCE

A small portion of current staff time is devoted to supporting water quality compliance activities. A total of $158,000 and 0.29 FTE additional staff are anticipated for the recommended activities summarized below.

Recommendation	Prioritization		Additional Funding Needs	Additional Staff Support (hours/year)
	H/M/L	Justification		
Develop and implement a pollution control program for water bodies currently on the 303(d) list of impaired waters	H	Multiple waterbodies within the city are included on Ecology's 303(d) list of impaired waterbodies, but no TMDL implementation plans have been developed by Ecology for these waterbodies. To avoid a TMDL and cost associated with implementing a TMDL, the City should take action to remove these waterbodies from the 303(d) list by developing a pollution control program.	$100,000	80
Develop and implement surface water flow monitoring program (currently underway).	H	Funding was provided to Clallam County Streamkeepers for flow monitoring through 2015 and will also be supported by City volunteers.	$0	0
Use GIS to identify UIC wells that need to be registered with Ecology.	H	This is required by the EPA. Deadline for UIC registration has already passed. GIS should be updated with correct facility structures.	$0	24 (additional time for updating GIS is included under Asset Management)
Use online form to register wells.	H	This is required by the EPA. Deadline for this requirement has already passed.	$0	16
Develop and implement a plan to assess drywells classified as UICs.	H	This is required by the EPA. Deadline for this requirement has already passed.	$0	240

Recommendation	Prioritization		Additional Funding Needs	Additional Staff Support (hours/year)
	H/M/L	Justification		
Implement additional water quality monitoring recommendations included in the Water Quality Data Analysis Report: • 12 samples per year (6 during wet weather and 6 during dry weather) at 6 monitoring stations in Bell and Johnson Creek • Continuous monitoring of dissolved oxygen and temperature in Bell Creek during the summer months • Fecal source tracing in Bell Creek	M	These recommendations were developed as part of the Water Quality Data Analysis Report.	$38,000	80
Develop and implement a groundwater monitoring plan for stormwater constituents of concern.	M	The City should evaluate and implement future groundwater monitoring needs.	$10,000 (to develop plan and implement initial monitoring)	40
Develop and implement a nitrate groundwater monitoring plan.	L	The County is already tracking this.	$0	0
Develop and implement a stormwater facility monitoring plan (including private facilities).	L	The City currently requires monitoring for the first 3-5 years (for commercial and residential). There could be long term benefits of continuing this monitoring requirement.	$10,000 (to develop plan and implement initial public stormwater facility monitoring); cost of private stormwater facility monitoring to be handled by the private sector	40
Total			**$158,000**	**520 hours (0.29 FTE)**

SPECIES AND HABITAT PROTECTION

A total of 0.04 FTE additional staff are anticipated for the recommended activities summarized below.

Recommendation	Prioritization		Additional Funding Needs	Additional Staff Support (hours/year)
	H/M/L	Justification		
The City should participate in Dungeness River Management Team (DRMT) routine meetings and request smolt outmigration data from Bell Creek measured by the Tribe.	H	Participation in the DRMT could lead to sources of funding for work that also benefit stormwater	$0	48
The City should participate in DRMT routine meetings and with Water Rule implementation groups.	H	Participation in the DRMT and Water Rule implementation groups could lead to sources of funding for work that also benefit stormwater	$0	24 (DRMT meeting hours summarized above)
Ensure habitat access by examining and replacing all culverts if they pose barriers to fish passage.	M	Some of these culverts will be included in the capital facilities projects included in the Master Plan	Included in the Master Plan	0
Maintain riparian buffers to control water temperature and provide forage material	M	Maintenance of riparian buffers will not be identified as a specific project in the Master Plan, but should be considered for future projects along stream corridors.	$0	0
Utilize soft bank stabilization methods, levee setbacks, and limit the use of riprap and other bank hardening methods to allow natural stream migration and off-channel habitat formation.	M	Utilization of soft bank stabilization methods and levee setbacks will not be identified as a specific project in the Master Plan, but should be considered for future projects along stream corridors.	$0	0
Determine whether the City needs to update floodplain mapping within City limits to be in compliance with the National Floodplain Insurance Program (NFIP) and restrict development within the floodplain.	L	Updating floodplain mapping will not be identified as a specific project in the Master Plan, but should be considered as part of future planning efforts	$0	0
Total			**$0**	**72 hours (0.04 FTE)**

STORMWATER DESIGN GUIDANCE AND PLAN REVIEW

Currently, no City staff are dedicated to implementing the stormwater requirements in the City's code for new development, redevelopment, and construction sites which includes conducting stormwater plan review, construction inspections, and post-construction inspections. A total of 0.27 FTE additional staff and $40,000 additional funding are anticipated for the recommended activities summarized below.

Recommendation	Prioritization		Additional Funding Needs	Additional Staff Support (hours/year)
	H/M/L	Justification		
Review the 2012 SWMMWW (and 2014 modifications) and consider developing an amendment to the 2012 SWMMWW that provides guidelines and requirements specific to the City.	H	The City should review the latest SWMMWW since it is adopted by reference in the SMC.	$0	0
Determine which BMPs are most effective in protecting groundwater quality while preserving recharge as part of the Master Plan and consider including these BMPs in an additional guidance document or amendment to the 2012 SWMMWW.	H	BMPs to protect groundwater quality and preserve recharge are important, but the City should focus on identifying existing approved stormwater BMPs that may be effective.	$0	80
Develop handouts that summarize on-site stormwater management, treatment, and flow control thresholds for when the SWMMWW applies for single-family and commercial development projects. Update in the SMC as needed.	H	Providing handouts and updating the SMC to include guidance for when and where thresholds apply to projects will help developers better implement stormwater requirements.	$10,000 (assumes 100 consultant hours at $100/hour)	40
Develop a consistent stormwater plan review process that includes checklists, sizing table tools, and plant lists for site plan review to increase efficiency.	H	Having a consistent and clear Plan Review process will help make sure that developments and stormwater facilities are designed to City standards.	$10,000 (assumes 100 consultant hours at $100/hour)	120
Look for opportunities to partner with Clallam County in a watershed-scale planning effort.	H	Watershed scale planning can be an effective way of planning for stormwater and development, and there are many documented issues related to flooding, erosion, habitat degradation and water quality impairment that may be improved through the implementation of a watershed plan.	Included in Master Plan	0

Recommendation	Prioritization		Additional Funding Needs	Additional Staff Support (hours/year)
	H/M/L	Justification		
Review AHBL's Code Revision recommendations re: LID, review additional sections of the SMC identified in the Stormwater Management Needs Assessment (Sequim 2014), update as needed, develop a brief summary report, and coordinate with City Council to review and approve proposed changes to SMC.	M	The City has already gone through the revision process for much of the SMC regarding LID, but should continue to review and revise other sections and determine if the LID recommendations proposed by AHBL can be implemented.	$10,000 (assumes 100 consultant hours at $100/hour)	80
Consider promoting or incentivizing secondary uses for stormwater such as rainwater collection (e.g., cisterns) and reuse for irrigation and toilet flushing.	M	Secondary uses for stormwater runoff may help reduce flooding issues in the City.	$10,000 (assumes 100 consultant hours at $100/hour)	40
Promote upcoming training opportunities for designers (specifically on the 2012 SWMMWW).	M	Training designers on stormwater requirements will help improve drainage design in the City.	$0	0
Coordinate with the Clallam Conservation District and WSU Extension for additional training opportunities for staff.	M	The City should engage in regional stormwater groups and stay updated on LID and pollution source detection and elimination training.	$0	40
Train staff when updates occur to planning, development, inspection, and enforcement of stormwater runoff controls.	L	Training will eventually be helpful, but City should focus on developing these processes first.	$0	80
Total			**$40,000**	**480 hours (0.27 FTE)**

ASSET MANAGEMENT

Currently, the City does not have an asset management program. A total of 0.61 FTE and $6,000 additional funding additional staff are anticipated for the recommended activities summarized below. A total of 1.02 FTE were included in the funding analysis that was developed in support of the Master Plan recommendations; thus the funding analysis provides a conservative estimate of the level of support needed for this program. The City's existing camera equipment can be used for the asset inventory.

Recommendation	Prioritization		Additional Funding Needs	Additional Staff Support (hours/year)
	H/M/L	Justification		
Continue to update the storm system map and database as needed.	H	Important to have accurate stormwater mapping for a variety of other stormwater program components in addition to pollution source detection and elimination.	$0	160
Develop a system to ensure that new development projects with stormwater components are incorporated into GIS.	M	In addition to mapping of the existing system, it is also important that new projects be incorporated into GIS.	$0	40
Improve the existing asset inventory by updating stormwater system components in GIS with current conditions	M	This inventory could be conducted with the City's existing camera equipment.	$6,000 (uses existing camera equipment and SEMS software, but additional funding is needed for field tablets)	0.5 FTE (includes initial ramp up of program, ongoing inspections, and management of GIS data)
Total			**$6,000**	**1,084 hours (0.61 FTE)**

STORMWATER SYSTEM OPERATIONS AND MAINTENANCE

Currently, a total of 0.75 FTE conduct stormwater system O&M activities. A total of 1.54 FTE additional staff and $281,000 additional funding are anticipated for the recommended activities summarized below.

Recommendation	Prioritization		Additional Funding Needs	Additional Staff Support (hours/year)
	H/M/L	Justification		
Add maintenance and inspection information to the storm system map and database in GIS.	H	Important to have accurate stormwater mapping for a variety of other stormwater program components in addition to effectively tracking O&M (see Asset Management).	$0	120

Recommendation	Prioritization		Additional Funding Needs	Additional Staff Support (hours/year)
	H/M/L	Justification		
Establish maintenance agreements with irrigators and other stormwater management partners addressing type and frequency of maintenance activities as well as responsibilities for maintenance.	H	Coordination with other entities for maintenance can help relieve some of the O&M responsibilities of City crews.	$0	120
Consider hiring seasonal workers to work on catch basin inspection crew.	H	Not currently enough staff to support adequate catch basin and other facility inspections.	$0	442
Increase staff support for inspecting and cleaning stormwater pipes and drywells.	H	The City has purchased jetting equipment and two cameras, but does not currently have sufficient staff support for operating this equipment.	$0	1,768
Evaluate street sweeping routine to determine if changes need to be made.	M	Assessing existing O&M activities can be useful, but the City should focus on implementing new O&M activities more regularly rather than assessing effectiveness of existing activities.	$0	0
Develop a policy for City inheritance of private stormwater facilities that specifies the condition that a private stormwater facility should be in prior to being inherited by the City. Consider coordinating this policy with the inheritance of private streets.	M	Some requests have been made for the City to inherit private stormwater facilities.	$0	40
Improve internal communications within Public Works to facilitate O&M activities.	M	Schedule monthly check-in meetings to facilitate O&M activities.	$0	0
Include the stormwater pond that drains part of the Shop parking lot in regular inspection and maintenance routines.	M	The City should focus efforts on bigger picture stormwater O&M program and processes; however, these facilities should be on the list of facilities to maintain (once a list is established).	$0	0
Develop an Integrated Pest Management Plan (IPMP) for right-of-way vegetation and stormwater facility maintenance	M	An IPMP would help clarify action thresholds for maintenance of pest species and monitoring and reduce the use of harmful chemicals that results in stormwater runoff contamination.	$15,000 (assumes 150 consultant hours at $100/hour)	0

Recommendation	Prioritization		Additional Funding Needs	Additional Staff Support (hours/year)
	H/M/L	Justification		
Develop SOPs for O&M staff.	M	Identified as a need during staff workshop.	$0	80
Review SWPPPs developed for other Cities and Counties to determine if a similar plan should be developed for the City Shop.	M	Identified as a need during staff workshop.	$0	80
Require City O&M staff attendance at trainings, especially those related to maintenance of LID BMPs. Invite Irrigation District O&M staff to attend trainings.	M	Identified as a need during staff workshop.	$0	80
Remove trash and litter from problem areas, set up a notification system and response, or implement a program for volunteer trash clean ups that prioritizes problem areas.	L	The City should focus efforts on maintaining higher priority stormwater system issues (e.g., flooding).	$0	0
Invite vendors to present on how to maintain their technologies.	L	The City should focus efforts on cleaning and maintaining the more common structures in the City (i.e., drywells, infiltration lines and catch basins).	$0	0
Obtain additional tools and equipment to inspect, maintain, and repair LID facilities.	L	The City should focus cleaning and maintenance activities on drywells, infiltration lines and catch basins, however should consider purchasing equipment for LID facility maintenance in the future.	$266,000	0
Total			**$281,000**	**2,730 hours (1.54 FTE)**

POLLUTION SOURCE DETECTION AND ELIMINATION

The City does not currently have a pollution source detection and elimination program, and no staff are allocated to pollution source detection and elimination activities. A total of 0.19 additional staff and $24,000 additional funding are anticipated for the recommended activities summarized below.

Recommendation	Prioritization		Additional Funding Needs	Additional Staff Support (hours/year)
	H/M/L	Justification		
Develop and implement a pollution source tracking program. • Obtain field equipment that can be used for illicit discharge field screening and source tracing. • Develop a basic training program for City field staff. • Develop a system for tracking all illicit discharges reported and investigated.	H	Actively identifying pollutant sources could save time and budget by identifying issues prior to when more expensive repairs may be required. Even if the City does not establish a full blown pollution source identification and detection program, it is important to have pollution source field screening and source tracing equipment on hand, a basic training program, and a basic tracking system for illicit discharges. The cost included here for equipment is for an intermediate level field screening and source tracing program.	$4,000 (developing program; assumes 40 consultant hours at $100/hour) $6,000 (equipment costs) $4,000 (training; assumes 40 consultant hours at $100/hour)	40 (developing program) 80 (developing tracking system)
Develop a spill reporting hotline or web form.	H	This could be approached from a City or regional perspective, but it is important to have a number that people can call when they identify an issue.	$0	80
Update illicit discharge ordinance, or provide policy direction for interpreting it.	M	The City has an existing ordinance; this would be an update to add prohibited and allowable discharges and enforcement procedures, including car wash discharge policies.	$0	40
Provide pollution source detection and elimination education as part of the City's ongoing public education program to the general public and businesses.	M	No additional cost included for this item (covered under Public Education estimated funding and staffing).	$0	0
Require staff involved in illicit discharge response to review the Illicit Connection/Illicit Discharge Field Screening and Source Tracing Guidance Manual that was developed for the State of Washington (Ecology 2013)	M	This is an important statewide guidance manual that contains information that would be useful to the City in developing their pollution source detection and elimination program.	$0	8

Recommendation	Prioritization		Additional Funding Needs	Additional Staff Support (hours/year)
	H/M/L	Justification		
Develop and implement a pollution source field screening program for the City's stormwater system.	L	This is a lower priority recommendation, since it is based on a specific NPDES Phase II Permit requirement, and the City is not currently an NPDES Phase II permittee.	$10,000 (assumes 100 consultant hours at $100/hour)	80
Total			**$24,000**	**328 hours (0.19 FTE)**

PUBLIC EDUCATION AND INVOLVEMENT

Currently, around 40 hours per month are spent on stormwater public education and involvement. A total of 0.29 FTE additional staff and $39,000 additional funding are anticipated for the recommended activities summarized below.

Recommendation	Suggested Prioritization		Additional Funding Needs	Additional Staff Support (hours/year)
	H/M/L	Justification		
Provide additional guidance (e.g., factsheets, brochures, or checklists) for developers and builders on meeting the City's stormwater facility design, maintenance, and construction requirements.	H	This was an important topic brought up at the workshop and will help to save City reviewers time during stormwater site plan review. Factsheets and brochures for developers and builders are more critical, but checklists or handouts could also be useful.	$4,000 (brochures/ factsheets; assumes 40 consultant hours at $100/hour) $8,000 (checklists; assumes 80 consultant hours at $100/hour)	80 (brochures/ factsheets) 40 (checklists)
Develop outreach materials for residents, landscapers, property managers/ landowners, the general public, and businesses.	H	Outreach materials would be an important and valuable tool for the City's stormwater program.	$12,000 (assumes 120 consultant hours at $100/hour)	120
Attend regional meetings and participate in regional forums and such as the West Sound Stormwater Managers' Coordination Group, the Clallam County Clean Water Work Group the Association of Washington Cities (AWC).	H	"Coordination with other entities" included in Stormwater Management Needs Assessment (Sequim 2014). Coordination with other entities can save budget through sharing ideas and approaches for stormwater education.	$0	40

Recommendation	Suggested Prioritization		Additional Funding Needs	Additional Staff Support (hours/year)
	H/M/L	Justification		
Attend regional conferences and meetings on stormwater and surface water management.	H	Coordination with other storm and surface water management entities can improve the City's own surface and stormwater management program.	$0 (cost for conference and meeting attendance should be included in existing budget)	60
Determine what agreements with other parties may be necessary to achieve stormwater management goals.	H	Agreements with Irrigation entities, the County, and surrounding jurisdictions would be beneficial to regional stormwater management and water quality.	$0	80
Create a hotline and system for logging and responding to general stormwater-related complaints. The hotline could be used for all stormwater complaints, not just illicit discharges. Educate the public on how to use the hotline.	M	Would increase program efficiency and identification of problem areas.	$0	60
Continue to develop a Communications Plan.	L	Draft Communications Plan has already been completed	$0	0
Evaluate the costs and benefits of having a stormwater public education and outreach program.	L	It is already well known and documented that having a stormwater public education and outreach program is beneficial. Resources should be focused on developing materials rather than evaluating if there is a need.	$0	0
Reestablish storm drain marking program-- using storm drain markers, for example.	L	Messaging may not be as effective as other public outreach materials. Assumes volunteer labor and some City staff time for coordination.	$5,000 (for 1,000 plastic markers and glue)	40
Measure adoption of targeted behaviors and adapt program to best meet goals.	L	This is a lower priority recommendation, since it is based on a specific NPDES Phase II Permit requirement, and the City is not currently an NPDES Phase II permittee.	$10,000 (assumes 100 consultant hours at $100/hour)	0

Recommendation	Suggested Prioritization		Additional Funding Needs	Additional Staff Support (hours/year)
	H/M/L	Justification		
Identify opportunities for public participation throughout master plan development and implementation.	L	Opportunities for public participation already being identified through Master Plan development.	$0	0
Total			**$39,000**	**520 hours (0.29 FTE)**

CONCLUSIONS

A summary of the work items and costs required to implement the recommendations of this report is provided below:

- **Capital Facilities:** Currently, City staff do not spend a substantial amount of time on stormwater capital facilities. An initial stormwater capital facilities plan will be included in the Master Plan.
- **Inspection Program:** Currently, no City staff are dedicated to implementing the stormwater requirements in the City's code for conducting stormwater construction inspections, and post-construction inspections for new development, redevelopment, and construction sites. A total of 0.17 FTE additional staff are anticipated to support the inspection program.
- **Water Quality Compliance:** Currently, City staff do not spend a substantial amount of time on UICs and only a small portion of current staff time is devoted to supporting monitoring and assessment activities. A total of 0.29 FTE additional staff and $158,000 are anticipated for the recommended activities summarized in this report.
- **Species and Habitat Protection:** A total of 0.04 FTE additional staff are anticipated to support species and habitat protection activities. Culvert replacements are anticipated to be included in the capital facilities plan included in the Master Plan.
- **Stormwater Design Guidance and Plan Review:** Currently, no City staff are dedicated to providing stormwater design guidance and conducting stormwater plan review. A total of 0.27 additional staff and $40,000 additional funding are anticipated for the recommended activities summarized in this report.
- **Asset Management:** Currently, the City does not have an asset management program. A total of 0.61 FTE additional staff and $6,000 additional funding are anticipated for the recommended activities summarized in this report.
- **Stormwater System Operations and Maintenance:** Currently, a total of 0.75 FTE conduct stormwater O&M activities. A total of 1.54 FTE additional staff and $281,000 additional funding are anticipated for the recommended activities summarized in this report.
- **Pollution Source Detection and Elimination:** The City does not currently have a pollution source detection and elimination program, and no staff are allocated to pollution source detection and elimination activities. A total of 0.19 additional staff and $24,000 additional funding are anticipated for the recommended activities summarized in this report.
- **Public Education and Involvement:** Currently, only about 40 hours per month are spent on stormwater public education and involvement. A total of 0.29 FTE additional staff and $39,000 additional funding are anticipated for the recommended activities summarized in this report.

REFERENCES

AHBL. 2009. Sequim Project Summary: 2009 Local Regulation Assistance Project Summary from AHBL. Prepared for Puget Sound Partnership by AHBL.

Clallam County. 2014. DRAFT Comprehensive Stormwater Management Plan. Prepared by Clallam County for Planning Commission Review. January 2014.

Department of Health (DOH). 2015. Shellfish Safety Information, interactive map. <https://fortress.wa.gov/doh/eh/maps/biotoxin/biotoxin.html>. Updated January 7, 2015. Accessed January 7, 2015.

Ecology. 2011. Water Quality Assessment Category 4b. Washington State Department of Ecology Water Quality Program. Olympia, Washington. <http://www.ecy.wa.gov/programs/wq/303d/wqassescat4b.html>. Updated April 2011.

Ecology. 2012a. Western Washington Phase II Municipal Stormwater Permit. Washington State Department of Ecology Water Quality Program. Olympia, Washington. August 1, 2012. Modified December 17, 2014.

Ecology. 2012b. Stormwater Management Manual for Western Washington. Publication No. 12-10-030. Washington State Department of Ecology, Olympia, Washington. August 2012. Modified December 17, 2014.

Ecology. 2013. Illicit Connection and Illicit Discharge Field Screening and Source Tracing Manual. Prepared for the Washington State Department of Ecology by Herrera Environmental Consultants. May 2013.

Elwha-Dungeness Planning Unit. 2005. Elwha- Dungeness Watershed Plan, Water Resource Inventory Area 18 (WRIA 18) and Sequim Bay in West WRIA 17: Volume 1. Prepared by the Elwha-Dungeness Planning Unit and Elwha-Dungeness Initiating Governments. May 2005.

Herrera. 2013. Illicit Connection and Illicit Discharge Field Screening and Source Tracing Guidance Manual. Prepared for Washington State Department of Ecology by King County, Washington Stormwater Center, and Herrera Environmental Consultants, Inc., Seattle, Washington. May 7, 2013.

Sequim. 2014. City of Sequim Stormwater Management Needs Assessment. Prepared by Ann Soule, City of Sequim Public Works. Sequim, Washington. May 2014.

APPENDIX A

Background Document List

Table A-1. Sequim Existing Document Review Summary.

Document Name	Author	Date	Notes
Stormwater Planning Documents			
City of Sequim Stormwater Management Needs Assessment	Ann Soule, City of Sequim Public Works	May-14	• Part 1 includes applicable City Goals and Policies related to stormwater. • Part 2 includes a description of physical setting, capital facilities (city owned and non-city owned), descriptions of the City's stormwater programs, and regulatory context (including National and Statewide NPDES, Federal laws, and City Code). • Part 3 identifies needs of the stormwater program (most important being capital improvements, interjurisdicitional collaboration, facility inspections, long term planning, water quality and habitat information, education and outreach, and funding strategies). • Appendix A includes capital project summaries. • Should use this source when developing stormwater program section, needs, and identifying capital projects
City of Sequim Stormwater Management Needs Assessment presentation	Ann Soule, City of Sequim Public Works	Feb-14	• Summarizes Needs Assessment • Photos may be useful in Master Plan
Recommendations from the LID Local Regulation Assistance Project	AHBL (Wayne Carlson)	2009	• Provides recommendations and suggestions for implementing LID in Sequim, Port Townsend, Island County, and Kent. • Draft regulation changes and LID recommendations for adoption • Page 15 contains summary of recommendations for Sequim • Four titles reviewed (Streets, Sidewalks, and Public Places; Public Services; Subdivisions; Zoning) • Encourage/ require permeable pavement sidewalks and rights-of-ways, bioretention in street design • LID Site Analysis requirement for subdivision development • Added native vegetation retention standards • City concerned with effectiveness of LID due to high groundwater and clay soils
Sequim Code and Ordinances			
City codes and ordinances pertaining to stormwater (and draft ordinances), including documents referenced in code such as Ecology's stormwater management manual(s)	City of Sequim	NA	• Chapter 13.104- Stormwater Management. Adopts Ecology SWMMWW (latest edition). • Chapter 13.108- Stormwater Maintenance. • Title 12- Streets, Sidewalks and Public Places. • Title 17- Subdivisions. • Title 18- Zoning. Considerations for LID and Site Planning in 18.24.070.
Planning Documents			
Citywide Comprehensive Plan (2006)	City of Sequim	Aug-06	• Goals and Policies in each chapter • Use for background policies/ goals related to development/ stormwater • Chapter 3- Land Use • Chapter 4- Urban Growth Element (UGAP-10 concerns level of service for stormwater systems in UGA) • Chapter 5- Environment and Open Space Element (mentions use of LID techniques to design with the natural landscape, protection of sensitive areas, open spaces, wetlands, ENVP-7 concerns protection of groundwater resources and aquifer recharge areas through effective SW management, ENVP-9 concerns promoting LID and green construction methods) • Chapter 6- Shorelines Element • Chapter 7 - Utilities Element (describes sewer and stormwater infrastructure, PUDs required to manage and treat stormwater onsite using bioswales, rain gardens, retention/ detention ponds, UTG-9 concerns seeking assistance and cooperation of PS Action Team and Ecology for improvements to the SW Management Plan) • Chapter 9 - Housing Element • Chapter 10- Economic Development Element • Chapter 11 - Parks and Recreation Element • Chapter 12- Historic and Cultural Resources Element • Chapter 13 - Capital Facilities Element (CFG 18 and 19 related to maintaining stormwater system integrity and function,CFG 20 concerns financial resources for Stormwater Drainage Utility, CFG 25 concerns new development costs of new capital facilities needed to serve the development) • Chapter 14- Government Element • Chapter 15 - Implementation

Table A-1. Sequim Existing Document Review Summary.

Document Name	Author	Date	Notes
Sequim 120 Comp Plan Update information	City of Sequim	NA	• Summarizes a few key directions related to the Sequim 120 Vision adopted in 2012 • Keep neighborhood density consistent (don't increase significantly) • Preserve larger, rural parcels • Place higher density development in downtown area • Plan for pedestrian friendly environment everywhere
Past and current capital facility projects related to stormwater (such as the infiltration basin facility at Reuse Demonstration Park), and related Capital Improvement Program (CIP) elements	NA	NA	Decided not to review unless involved in a proposed CIP project.
2011-2016 City of Sequim Transportation Improvement Program (TIP) project list (includes the 6-year and 20-year project lists)	Fehr & Peers	Jun-13	• Includes Transportation Improvement Projects (6-year project list and 20-year project list) • Most of the 6-year projects are pedestrian infill and new roadways to support near-term development (bicycle projects, intersection improvements, roadway enhancements, pedestrian mobility projects, new roads). Look for opportunities to construct stormwater CIP projects in conjunction with TIP projects. • #1- Bicycle facility @ Sunnyside Ave b/w E Fir Street & E Prairie Street • #2- Shared use path @ 3rd Avenue b/w Happy Valley Road & Reservoir Road • #3- Bicycle facility @ 3rd Avenue b/w US-101 & W Fir Street
2013 General Sewer Plan	Gray & Osborne	Dec-13	• Figure 1-4: soil classification map • Some good introductory background information on groundwater, soils, climate, precipitation, sensitive areas, wetland areas, water bodies, zoning. • Figure 1-10 shows existing parcels served by public or private on-site septic systems • Includes data on project city population, flows, and loadings • Staff and maintenance: 24 public works staff members including managers, engineers, operators, field staff, office staff, public works director • Look to for potential collaboration with stormwater CIP projects. Recommended projects for 2012-2018: East Hammon Street Sewer Extension (CS-12), North Blake Street Sewer Improvements (CS-13). Recommended projects for 2018-2032: Sunnyside Street Sewer Improvements (CS-9), WRF Influent Trunk Pipeline Repair/ Replacement (CS-7). See Figure 3-6 and table 3-11 for full list of projects. • Chapter 4 concerns water reclamation and reuse facilities. o Reclaimed water is provided to City Shops facility, landscape irrigation system along Sequim Ave, Lofgrin Road and Washington Harbor Loop Road, and to the Reuse Demo Site. Reused water is also supplied to a fire hydrant at City Shops for truck filling or local use. Locations of the transmission lines are shown in Figure 1-6 and 3-1. o Ultimate goals of the water reuse facility were to reopen an existing shellfish closure area to benefit state and tribal resources, improve streamflows into the Dungeness River, and profile sustainable water supply for irrigation. o Future water reuse uses include: commercial, more landscape irrigation, toilet flushing, hydrants, groundwater recharge, leaky pipes or additional streamflow augmentation o 2011 Reclaimed Water Report suggested potential areas that could receive reclaimed water (for each of the uses above). • Chapter 5 discusses infiltration and inflow (I/I) within the City's collection system. City has been diverting stormwater from roof drains from the sanitary sewer, lining sewer pipes, and purchased a CCTV camera to inspect sewer pipes for I/I. The City also uses visual inspections, smoke tests and flow monitoring to detect I/I. • Chapter 6 discusses O&M related to waste water. Table 6-4 displays estimated future staffing needs (estimate is 1.6 additional FTE for 2018, and 5.6 additional FTE for 2032).
2013 Water System Plan	Gray & Osborne	Jun-13	• Same sort of background data as in the General Sewer Plan. • Chapter 2- Basic Planning Data. • Chapter 3- System Analysis. Compares existing facilities to design standards. • Chapter 4- Water Use Efficiency. Discusses reclaimed water efforts in the City. • Chapter 5- Source Protection Program. Wellhead protection program, including aquifer susceptibility, wellhead protection area delineation, inventory of potential contaminant sources, potential contaminant inventories, spill response, contingency planning, and management plan. • Chapter 6- Operation and Maintenance Program. • Chapter 7- Water System Design and Construction Standards. • Chapter 8- Capital Improvement Plan. Contains identified CIP projects and schedule. • Chapter 9- Financial Analysis.

Table A-1. Sequim Existing Document Review Summary.

Document Name	Author	Date	Notes
Shoreline Master Program	City of Sequim	2013	• Policy 2 and 5 concern stormwater treatment goals/policies • Section 6.1.5 Water Quality, Stormwater, and Nonpoint Pollution regulations for stormwater treatment/ management in the shoreline, and encourages use of LID • Includes Johnson Creek (in the shoreline jurisdiction of the City), but also mentioned Bell Creek and Washington Harbor Use in Master Plan in policies and waterbody section
Sequim Downtown Plan	City of Sequim	NA	• Policies to establish City Center with various zones and districts, addresses land use density, intensity of development, economics, transportation, housing, parks, etc. • Recommended actions related to utilities include development of a new SW Management Plan, continue development and distribution of the reclaimed water system
Water Quality Documents			
Surface Water Quality			
Clallam County Streak Keepers Data and Report (STORET)	Clallam County DCD	Sep-12	STORET Data and draft report form the County will be used in the Water Quality Analysis Report.
Stormwater Quality			
Water quality data from EIM	NA	NA	Stormwater data from Eight Streams and Clean Water District will be used in the Water Quality Analysis Report.
Groundwater Quality			
Groundwater Quality Monitoring in the Shallow Aquifer near Sequim, Clallam County, WA Phase I	Ann Soule	Jun-09	• Study of groundwater quality downgradient of urban and suburban land uses in the City. Nitrates were detected in all study wells sampled at levels below safe drinking water levels. Recommendations include monitoring for nitrate in other areas and for stormwater contaminants in wells vulnerable to land activities. • Use in groundwater section of Master Plan.
Groundwater Quality Monitoring in the Shallow Aquifer near Sequim, Clallam County, WA Phase II	Ann Soule	Jun-11	• Phase II of groundwater quality study. • Examined groundwater quality in the shallow aquifer discharging to streams and marine waters of the Dungeness watershed to determine the ambient quality of the shallow groundwater for a broad region, and determine the concentrations of specific stormwater contaminants for wells in Phase I. • Study found high nitrate concentrations around developed areas where soils are sandy-gravelly and low chloride concentrations. • Recommendations include continued land use management efforts to enforce septic system maintenance, stormwater treatment, groundwater protection. • Use in groundwater section of Master Plan.
Groundwater Quality Monitoring in the Shallow Aquifer near Priest Road, Clallam County, WA Phase II	Ann Soule	Nov-05	• Study monitored groundwater quality outside of western Sequim city limits used for county residents shared or private drinking water wells. • No detections of bacteria, hydrocarbons, pesticides, or other organics. Trace amounts of chromium and zinc, and nitrates and TDS below safe drinking water action levels. • Use in groundwater section of Master Plan.
City of Sequim 2008 Hydrologic Monitoring Report	Pacific Groundwater Group	Dec-09	• Study of hydrologic trends in the Sequim- Dungeness watershed. • Includes compiled data on the following topics: surface water system, groundwater system, precipitation trends, climate change, stream systems, groundwater and surface water use, irrigation, aquifer recharge, land use changes, groundwater and surface water quality. • Use in Master Plan for data related to the topics above.
Sequim Maps and GIS Data			
2013 Water System Plan Figure 5-3, Wellhead SOCs	Gray & Osborne	2013	Figure shows wellhead ZOCs within the City, as well as locations of underground storage tanks, leaking underground storage tanks, hazardous waste, and septic system.
Information on projected growth as well as planned developments or land use changes from the Department of Community Development	Chris Hugo	Nov-14	•Email from Chris Hugo. •20-year growth framework is based on 2% annual growth, averaged over 20 years. Plan on 1% increase for at least the five years, and >2% rates for the rest of the 20 year duration. The Water Rule situation may push these rates to 1.5% for 5 years, and 3-4% for the rest of the 20-year duration. •Approximately half of the growth will occur in existed platted lots, and a quarter would occur in existing subdivisions. Downtown may not grow as a residential neighborhood for several years.
Elwha-Dungeness Watershed Management Plan	Entrix	May-05	• Chapter 2 - Watershed Characterization. Related to Sequim are the Dungeness Watershed and the Sequim Bay and Drainages sections. • Chapter 3- Recommendations. Includes recommendations for water quality, water quantity, habitat, instream flow, stormwater, land use and land management, public education and outreach, watershed management, Sequim Bay and Drainages. • Refer to Chapters 2 and 3 for information for Basin Characterization section of Master Plan.

Table A-1. Sequim Existing Document Review Summary.

Document Name	Author	Date	Notes
Geographic information system (GIS) data and maps including existing stormwater system, soils, water resources, utilities, land uses, aerial photos, LIDAR, streets, topography, zoning, tax lots, buildings, irrigation district boundaries and conveyance infrastructure, and private stormwater facilities	City of Sequim	NA	• Streams • Catch basins • City limits • Roads • UGA • Irrigation system infrastructure (ditches, pipes, ditch in creek; included in Needs Assessment maps) • City drainage features (drywells, pipes, ditches, bioswale, detention/retention pond) • Runoff and flooding problem areas • Subbasin boundaries •Wetlands • Parcels • Lidar Contours (50ft)
Sequim Policies			
Dungeness Instream Flow and Water Management Rule and Mitigation Policies	webpage	NA	• Describes Ecology's water management rule for the Dungeness watershed to secure water supplies for current and future uses in the Sequim area. • Rule is designed to protect existing water rights, manage new uses of water, protect fish resources, protect stream flows. • Rule affects those who start new uses of water and requires them to mitigate the impact of their water use on streams. Mitigation can be in the form of a payment to the Dungeness Water Exchange, or through an independent mitigation plan approved by Ecology. • Refer to the Water Rule for sections in the Master Plan pertaining to policies and development requirements.
Dungeness Instream Flow and Water Management Rule and Mitigation Policies (Mitigation plan)	Washington Water Trust	Dec-12	• The Plan was developed for the Dungeness Water Exchange (Exchange) to fulfill the requirements under WAC 173-518-075. • Purpose if to fund projects that will generate mitigation credits and sell to prospective water users who trigger mitigation for their impacts to small streams and the Dungeness River. • The Dungeness Mitigation Strategy identifies all of the potential water for water project types that could be used to generate mitigation credits. Shallow aquifer recharge will be the primary strategy for generating mitigation. • Refer to the Water Rule for sections in the Master Plan pertaining to policies and development requirements
Clallam County Water Rule	webpage	Jan-13	• Water Rule established by Ecology to manage scarce water resources in the Dungeness River and adjacent drainages Webpage provides links for Water Rule information, and aims to help the public meet the Water Rule requirements through permitting process • Interactive map here: http://www.clallam.net/aimsxwebsite/water_rule/viewer.htm • Policy decisions are summarized here : http://www.clallam.net/permits/Determinations.html • Describes where mitigation for water use is required (i.e., mitigation not required for expanding existing residential house, but is required for addition of auxiliary unit) • Refer to the Water Rule for sections in the Master Plan pertaining to policies and development requirements
Studies			
Aquifer Recharge Feasibility Study for the Dungeness Peninsula	Pacific Groundwater Group	Mar-09	• Study evaluated feasibility of performing aquifer recharge and aquifer storage and recovery on the Dungeness Peninsula (WRIA 18). • Dungeness River groundwater level declines have reduced baseflow in Dungeness River. Many other small streams and rivers are fed by groundwater and will experience baseflow reductions as well. • Objectives of the AR/ ASR project include: improve Dungeness low flows, support small streams and channels, provide or mitigate new water development in place of exempt wells, reduce potential for seawater intrusion. • Three scenarios evaluated: Infiltration of Dungeness River water west of the Dungeness River, Infiltration of reclaimed water east of the Dungeness River, and Aquifer storage and recovery west of the Dungeness River. • Use report for sections of the Master Plan pertaining to groundwater, Dungeness River watershed, aquifer recharge
2008 Dungeness Groundwater Flow Model Design, Construction, Calibration and Results	Pacific Groundwater Group	Mar-09	• Reports the calibration of groundwater flow model of the Dungeness Peninsula and its application to predict hydrologic responses to aquifer recharge and aquifer storage and recovery. • The Ecology 2003 Model was refined and calibrated. Two realizations of the model predicted steady-state calibration results. • Significant results include: shallow aquifer water level variations over time controlled predominantly by the recharge schedule; aquifer recharge sites closest to the Dungeness River predicted to provide greater augmentation to the river; aquifer recharge areas further from the river predicted to provide more sustained, year-round augmentation to the Dungeness River but at fairly low rates; aquifer storage and recovery sites in the middle of the aquifer have a larger impact to baseflow. • Use report for sections of the Master Plan pertaining to groundwater, Dungeness River watershed, aquifer recharge.

Table A-1. Sequim Existing Document Review Summary.

Document Name	Author	Date	Notes
Hydrogeologic Screening for Sequim Pilot Infiltration Test	Peter Schwartzman & Jeff Witter, Pacific Groundwater Group	Aug-07	• Hydrologic screening of five sites east of Dungeness River for suitability for infiltration of reclaimed water and/or surface water diversions. • Results of the screening suggest high transmitting capacity for infiltrated water, however soils are clay which may reduce infiltration capacity. • Use report for sections of the Master Plan pertaining to groundwater, Dungeness River watershed, aquifer recharge.
Hydrogeologic Assessment of the Sequim-Dungeness Area	USGS	1999	• Study of groundwater and relation between groundwater and surface water in the Dungeness River Area. • Study area underlain by unconsolidated Quaternary deposits, three aquifers, two confining beds, and undifferentiated deposits. • Increase in nitrate concentration in groundwater between 1980 and 1996, and concentration of nitrate in shallow aquifers were significantly higher under residential areas than under natural grasslands and forests. • During the last 20 years, population of study area has increased by 250%, and land use and water use has changed from agricultural to residential. Result is increased groundwater withdrawals and decrease in irrigation withdrawn from Dungeness River. • Groundwater and surface water are closely related. Primary water quality concern is nitrate. Sources of nitrate are unclear (septic systems, residential fertilizers, storage in soils)
Studies Related to Bell Creek, Johnson Creek, and Gierin Creek.			
Climate Vulnerability Assessment and Adaptation Plan, prepared for the Jamestown S'Klallam Tribe	Adaptation International	2013	• Changing climate conditions and adaptation information for Jamestown S'Klallam Tribe • Projected changes and adaptation information for Sequim area, but focused on tribal community concerns • Includes background on Dungeness River, importance of preservation, and actions to take • Include in Master Plan for background on climate change in the Sequim area, Dungeness River habitat and impact of climate change
Potential Stormwater Impacts on Sediment Quality in Urbanizing Clallam County Streams	Battelle	2003	• Study on streams located within WRIA-18 that are urban or urbanizing or agriculturally influenced, and have a high potential for salmon habitat restoration (includes Bell Creek) • Collected sediment samples and analyzed for heavy metals and hydrocarbons • Use in Master Plan for waterbody section (specifically Bell Creek)
Assessment of Wetland Functions and Wetland Management Guidance for the Lower Dungeness River Area and Sequim Bay Watersheds	Clallam County DCD	1995	• Clallam County developed wetland database and management strategy with a grant from State Wetland Integration Strategy • Goals are to 1) update wetland inventory maps, 2) develop baseline data on existing wetland conditions, 3)establish GIS-based wetland information system, 4)develop methods to characterize and assess wetland functions, 5) develop wetland management guidance, 6) coordinate project objectives between state, local, federal management agencies • The project developed a wetland model to describe relationship of wetland to landscape • Used GIS to combine existing wetland inventory with landscape conditions(soils, surface water features), and habitat • Recommendations included 1) retain and enhance native vegetation in groundwater discharge wetland in Sequim Bay watershed, 2) In enclosed basins, prevent routing pollutants to wetlands,3)do not place facilities that may pollute groundwater adjacent to wetlands that discharge to groundwater, 4) retain and enhance vegetation in wetlands that discharge to groundwater, 5) expand education and assistance programs for landowners to control animal
Historical geomorphology and ecology of the Dungeness River delta and nearshore environments from the Dungeness Spit to Washington Harbor	Collins	2005	• Study on lower Dungeness River, its delta, and nearshore • Includes discussion of landscape evolution since 1800s compared to current conditions • Includes Bell Creek, Gierin Creek, and Washington Harbor • Use in Master Plan in waterbody section
Designation of critical habitat for Puget Sound Steelhead	National Oceanic and Atmospheric Administration	2013	• Proposed rules from National Marine Fisheries Service to designate critical habitat for lower Columbia River coho salmon and Puget Sound steelhead • Specific areas proposed for designation include freshwater and estuarine habitat areas in the Puget Sound • Within Sequim, areas designated include Indian lands and WDNR and WFP HCP lands. • Use in Master Plan in waterbody/ habitat restoration sections
Assessment of Baseflow in Small Streams of the Dungeness Watershed, Technical Memo	Peter Schwartzman , Pacific Groundwater Group	Jan-08	• Study evaluated groundwater derived baseflows in small streams on the Dungeness Peninsula • Streams represented in a groundwater flow model • Collected and compiled all available streamflow data • Includes information on Meadow Brook Creek, Cassalery Creek, Gierin Creek, Bell Creek, Johnson Creek • Use in Master Plan in waterbody section

Table A-1. Sequim Existing Document Review Summary.

Document Name	Author	Date	Notes
Surface Water Management Plan: Bell Creek and Johnson Creek	Quadra Engineering, Inc.	May-03	• Watershed assessment of Bell and Johnson Creeks • Includes existing land uses, water quality data, water quality problems, receiving water analysis, habitat impairments, and programs • Bell Creek: high concentrations of fecal coliform bacteria, low stream flow(lack of baseflow) during summer months, but overall the Creek's water quality has been improving since mid-1980s. • Johnson Creek: high concentration of fecal coliform bacteria • Use in Master Plan in waterbodies and drainage basins sections
Benthic Index of Biological Integrity (B-IBI), Clallam County,	Streamkeepers of Clallam County	Aug-12	• Bell Creek- highly/critically impaired (low B-IBI scores) • Meadowbrook- critically impaired
Bull Trout Final Critical Habitat Justification: Rationale for Why Habitat is Essential, and Documentation of Occupancy	US Fish and Wildlife Service	Sep-10	• Documents adult and subadult bull trout in rivers in the Olympic Peninsula, includes the Dungeness River. • Use in waterbodies section
Adapting to Climate Change at Olympic National Forest and Olympic National Park	US Forest Service	Aug-11	• Climate change and adaptation to climate change for natural resource managers • Ideas for how to adapt management of federal lands on the Olympic Peninsula in response to climate change • Potential effects of climate change on hydrology on the Olympic Peninsula (page 21) due to change in snowpack, temperature, streamflow timing • Use in Master Plan in climate change section
Effectiveness Monitoring of Fecal Coliform Bacteria and Nutrients in the Dungeness Watershed, Washington	Woodruff	2009	• Dungeness Targeted Watershed Initiative awarded a grant from EPA to clean surface water in the lower Dungeness Watershed • Three tasks: 1) Microbial Source Tracking, 2) BMP demonstrations related to water quality treatment, 3) effectiveness monitoring study. • This document focuses on Step 2(a)- Effectiveness of mycroremediation and bioretention cells in removing fecal coliform bacteria from surface waters in the Dungeness watershed • Goals of the study were to determine effectiveness of mycroremediation in bioretention cells at reducing fecal coliform and nutrients, compare effectiveness to typical bioretention cell, provide guidance on use and effectiveness of the BMP, improve overall functional habitat value by restoring native vegetation • Results indicated a significant reduction in fecal coliform bacteria from both the typical bioretention cell and from the mycroremediation cell. Data suggests that bioretention can reduce fecal coliform under a range of concentrations, and that mycroremediation treatment enhances or increases the reduction. • Nutrients were more difficult to evaluate since the data showed varying trends of export and removal. Overall, TN inflow increased 5x and outflow
Results of the Screening Analysis for Pharmaceuticals in Wastewater Treatment Plan Effluents, Wells, and Creeks in the Sequim-Dungeness Area.	Ecology	2004	• Ecology conducted a screening analysis for PPCPs in the Sequim-Dungeness area during November 2003. • Samples were collected from the WWTP effluent and from groundwater wells and creeks that may be impacted by the discharges • Nicotine, Caffeine, and Metformin were detected in the well and creek samples (far below known toxicity thresholds) • Additional monitoring needed before any conclusions for PPCPs can be drawn in relation to Sequim WWTP effluent\

APPENDIX B

Questionnaire

City of Sequim Stormwater Program Questionnaire

Instructions: Please assist Herrera by looking over this questionnaire and providing responses to questions *in your area of experience or expertise* using colored text or track changes (or Ann will interview you). Please provide as much readily-available information as you can, and identify any specific references you recommend we review later, such as brochures, City Code, records, or other City documents (check with Ann—we may have it already). There is no need to conduct any in-depth research to respond to these questions – please just provide what you know and identify where more research would help fill in any gaps. Send to Ann Soule no later than **Thursday, November 13**.

You only need to answer the questions marked with a highlighter or your name! All others are OPTIONAL!

Background

Herrera is assisting the City as it develops its first Storm and Surface Water Master Plan (Master Plan). The Master Plan will set goals, determine strategies, and define actions and funding for risk management, environmental stewardship, and regulatory compliance with regard to storm and surface water.

Stormwater Program Management

Public Education and Outreach – *David, Ann*

1. What types of educational brochures related to stormwater has the City developed and how are they distributed?

2. How does the City evaluate educational and outreach programs? What programs are most successful and least successful?

3. Are there any gaps in the City's public education program, and has the City considered any new educational programs to address these gaps? For what audiences?

Public Involvement and Participation – *David, Ann*

4. What are the established stakeholder groups that City officials consult with regarding stormwater?

5. How does the City solicit input and process comments on the stormwater program?

6. Does the City have a system (phone number, website, etc.) for the public to log general stormwater related complaints (e.g., drainage problems, construction site runoff)? How is this communication system advertised? How does the City respond to calls from the public?

Illicit Discharge Detection and Elimination – *David, Ann*

7. Has the City ever taken enforcement action against a citizen for non-stormwater discharge to the storm drain system?

8. Have there been known or suspected illicit discharges in the City? How were they identified? Has the City taken any action against these offenders?

9. Is there a hotline specifically for reporting illicit discharges? If so, how is it publicized? How many calls are received on average?

10. Are there any areas in the City where illicit discharges are perceived as a problem?

11. What land uses and industries are viewed as priority sources of stormwater pollution in the City?

12. Has the City conducted outfall inspections or other field screening methodologies for illicit discharges? If so, which methodologies have been used? Have the results been useful?

13. Does the City keep records of spills?

Monitoring – *Pete, Ann, Al*

14. Does the City conduct (or fund) any environmental monitoring? If so, please briefly describe this monitoring/existing programs.

15. Has the City identified any specific monitoring needs and identified staffing needs to accomplish the monitoring?

General Stormwater Program Status – *PW Managers; Leads for Streets, Sewer, WRF*

16. What elements of the current stormwater program/approach work well?

17. What elements don't work well, and what changes are recommended?

Program Staffing and Funding

18. How much staff time (in full time equivalent [FTE]) is currently allocated to stormwater for the following activities? – *PW Managers*
    a. Public education and outreach

    b. Public involvement

    c. Illicit discharge detection and elimination

    d. Monitoring

19. After the Master Plan, what are the most important aspects of your program that need additional funding? - *PW Managers*

    ☐ Operations and maintenance
    ☐ Capital improvements
    ☐ Stormwater site plan review
    ☐ Private facility inspections
    ☐ Public education and outreach
    ☐ Illicit discharge detection & elimination
    ☐ Other: _____

20. Which of the following funding sources are currently used to fund stormwater program activities? – *Sarah*

    ☐ Grants
    ☐ Loans
    ☐ Development review (permit) fees
    ☐ Revenue bonds for CIP projects
    ☐ Fee in-lieu of on-site stormwater control (to pay for regional stormwater facilities)
    ☐ General fund
    ☐ Special Purpose / Local Improvement District(s)
    ☐ Drainage for Flood Control Zone District(s)
    ☐ System development charges
    ☐ Intergovernmental coordination/leveraging
    ☐ City funding

Stormwater Maintenance

Overall – *Ty, Willie, Ann, Irrigators, County*

21. Does the City stormwater system map have any significant information gaps or inaccuracies?

22. How are records kept?

Private Stormwater Facility Maintenance – *David, Pete, Mike (Irrigators)*

23. Does the City ensure that maintenance is performed on private stormwater facilities? If so, how is that accomplished (e.g., additional education, code, maintenance covenants, plat documents)?

24. How frequently are privately owned stormwater facilities (e.g., ponds, vaults, pipes) inspected?

25. Are there differences in how stormwater facilities for new/ recent developments are maintained compared to stormwater facilities for older developments? Once older facilities "grandfathered" in are they maintained by the property owner or by the City?

City-owned Stormwater Facility Maintenance – ***David, Pete, Mike, Willie***

26. How many catch basins, culverts, stormwater facilities (e.g., Contech Filters, Vortechs, Aquaswirls, etc.) does the City maintain?

27. How many miles of open ditches and storm lines does the City maintain?

28. Is lack of facility maintenance viewed as a problem that contributes to flooding and poor water quality in the City? How severe are the problems (e.g., major, moderate, minor)?

29. How frequently are City owned or operated stormwater facilities (e.g., ponds, vaults, pipes) inspected?

30. Does the City maintain a list of maintenance problem locations (e.g., places that maintenance staff check on during and/or following major storms – aka Spot Check List)?

31. How often do maintenance staff check these locations?

32. How much is spent on contractors and equipment to maintain the system (i.e., vactors, sweepers etc.)?

33. Does the City currently have the needed vehicles and equipment to maintain the stormwater system?

Catch Basin Cleaning Program – *Mike, Ty*

34. What is the City's current catch basin inspection schedule/program?

35. Does the City have any intention to change the current catch basin inspection schedule/program in the future?

Street Sweeping Program – *Mike, Rick*

36. What is the City's current street sweeping schedule/program? Does the City plan to expand, reduce, or continue this program at the same level of effort?

Operations at City-owned Facilities

37. List pollutant-generating activities you think may occur at the following City-maintained facilities (e.g., stockpiling, vehicle maintenance, vehicle washing)?

City-maintained facility	Pollution-generating activities
Fleet vehicle yard	
Maintenance shop	
Parking lots	
Sidewalks	
Landscaped grounds	
Solid waste storage	
City office buildings	
Other:	

38. Do street and stormwater maintenance staff adhere to any BMPs or guidelines (e.g., perform vehicle maintenance indoors, wash vehicles at a commercial carwash facility, cover material stockpiles) to prevent pollution of the stormwater system? Which ones?

39. Have Stormwater Pollution Prevention Plans (SWPPPs) been developed for City-owned facilities that stockpile materials and/or wash or maintain vehicles outdoors?

40. Are standard operating procedures (SOPs) and guidelines in place for preventing stormwater pollution outside of City-owned facilities?

Managing Stormwater Assets – *Streets Manager*

41. Does the City have an active asset management program for its owned or operated stormwater infrastructure to determine lifespan and repair/replacement needs? If yes, answer the subsequent questions.

42. What types of assets or structures are regularly evaluated?

43. How are these assets evaluated and how often?

44. How often are underground assets (i.e., pipes, vaults, tanks etc.) evaluated?

45. Does the City have a repair or replacement schedule for its aging infrastructure?

46. Are existing funding sources adequate for the utility's repair and replacement needs – currently and in the future?

Staffing and Funding

47. How much staff time (in full time equivalent [FTE]) is currently allocated to stormwater maintenance (cleaning catch basins and pipes, sweeping streets, irrigation ditch maintenance?

48. Where does the funding for stormwater maintenance activities currently come from?

Capital Improvement Program (CIP) – *David, Mike, Ty, Rick, Roger, and others (and Irrigators, County)*

49. What is the risk and priority of the runoff and flooding problems identified in the 2014 Stormwater Needs Assessment? *(refer to separate Capital Projects worksheet and Appendix A of the Stormwater Needs Assessment)*

50. What are the major roadblocks to execution of any outstanding projects?

51. What capital projects are needed that are not addressed in this list? What problems will they address?

52. Are there any known problem areas that are not listed that would benefit from additional investigation or evaluation?

New Development, Redevelopment, and Construction Sites – *DCD*

Current Program

53. What type and quantity of development has occurred in the City over the last 10 years?

54. What type of development is expected in the next 10 years?

55. Are stormwater designers consistently using the Stormwater Management Manual for Western Washington (Ecology Manual)?

56. Do you think the Stormwater Management Manual for Western Washington is well suited for Sequim's environment? Are there any conflicts with the Stormwater Management Manual for Western Washington requirements/guidelines and what is feasible for Sequim?

57. How does the City verify facility performance during plan review (e.g., modeling, calculations, and professional judgment)?

58. Do the plan reviewers need any additional tools to increase efficiency (e.g., checklists, sizing tables, etc.)?

59. Who inspects erosion control BMPs on development sites?

60. Are erosion control BMPs usually implemented correctly?

61. What does the City do for enforcement when erosion control BMPs are not implemented correctly?

62. Are post-construction inspections for stormwater BMPs/facilities implemented? If so, how are they tracked?

63. Has the City revised any codes, rules, standards, or other enforceable documents to allow for low impact development (LID) based on the recommendations provided by AHBL in 2009?

Staffing

64. How much staff time (in full time equivalent [FTE]) is currently allocated to stormwater for the following activities?
    a. Stormwater site plan review (reviewing stormwater plans for new development)

    b. Stormwater construction site inspections (inspection of temporary erosion and sediment controls)

Priorities – *Everyone*

Overall Purpose

65. In your opinion, what are the City's top concerns with stormwater management?

66. What should be the City's first priorities for stormwater management?

Water Resources and Pollutants of Concern

67. What do you think are the City's first priorities for water quality and resource protection?

☐	Water quality in Bell Creek	☐	Fish habitat in Bell Creek
☐	Water quality in Johnson Creek	☐	Fish habitat in Johnson Creek
☐	Water quality in Gierin Creek	☐	Fish habitat in Gierin Creek
☐	Groundwater aquifer water quality		
☐	Other: _____		

68. What do you perceive as the biggest threats from stormwater on the resources you marked in the prior question?

CITY OF SEQUIM STORMWATER CAPITAL PROJECTS WORKSHEET

What is the risk and priority of the following runoff and flooding problems identified in the 2014 Stormwater Needs Assessment?

Creeks (refer to Appendix A1 photos and information)				
Problem #	**Problem Description/Location**	**Risk (H, M, L)**	**Priority (#)**	**Notes**
A1.01	Bell Creek flooding @ RM 0.2			
A1.02	Bell Creek culvert back up @ RM 1.3			
A1.03	Bell Creek flooding @ RM 1.4			
A1.04	Bell Creek culvert high flows @ RM 1.55			
A1.05	Bell Creek flooding @ RM 1.6			
A1.06	Bell Creek culvert back up @ RM 1.6			
A1.07	Bell Creek culvert back up @ RM 1.8			
A1.08	Bell Creek culvert back up @ RM 1.85			
A1.09	Bell Creek flooding @ RM 2.2 – 1.8			
A1.10	Bell Creek culvert back up @ RM 2.2			
A1.11	Bell Creek culvert gravel accumulation @ RM 2.5			
A1.12	Bell Creek culvert back up @ RM 2.6			
A1.13	Bell Creek culvert gravel accumulation @ RM 2.7			
A1.14	Bell Creek spillway discharge @ RM 3.5			
A1.15	Bell Creek valve discharge/creek erosion @ RM 3.6			
A1.16	Gieren Creek culvert back up @ RM 2.6			
A1.17	Johnson Creek erosion/habitat damage @ RM 1.6			

City-Owned Properties (refer to Appendix A2 information)					
Problem #	**Street**	**Cross Street/Location**	**Risk (H, M, L)**	**Priority (#)**	**Notes**
A2.01	S 2nd	Washington			
A2.02	S 3rd	Bell – SW corner			
A2.03	S 3rd	Hemlock – NW corner			
A2.04	S 3rd	Drive to Hideaway Homes MHP			
A2.05	N 5th	Cedar, SE corner			
A2.06	N 5th	Spruce, SE corner			
A2.07	N 5th	Alder, SE corner			
A2.08	N 5th	South of Hendrickson, west side across from SARC drive			
A2.09	S 5th	W Salal Place (south of 101)			
A2.10	S 5th	Sea Breeze apartments, near entrance to Avamere			
A2.11	S 5th	Near west entrance to Maple Ridge			
A2.12	7th	Washington, SW corner especially (in front of McDonalds)			
A2.13	N 7th	West shoulder and parking lot for Flooring business at 147 N 7th			
A2.14	N Blake	Fir			
A2.15	S Brown	300 feet south of Washington			
A2.16	S Brown	Washington, SW corner as well as south along Brown			
A2.17	S Brown	Hammond corner			
A2.18	E Brownfield	Entire length			
A2.19	Carrie Blake Park	Parking lot, SW and SE of Guy Cole			
A2.20	Carrie Blake Park	Skate park, near parking area			
A2.21	Carrie Blake Park	Playground, north side near swings			

City-Owned Properties (continued) (refer to Appendix A2 information)					
Problem #	**Street**	**Cross Street/Location**	**Risk (H, M, L)**	**Priority (#)**	**Notes**
A2.22	Carrie Blake Park (and Re-Use Park)	North side lower pond			
A2.23	Centennial Place	Sequim and Washington			
A2.24	Dunlap	341 Dunlap			
A2.25	Etta St	Center (between Sequim Ave and Sunnyside)			
A2.26	Falcon Rd	South end and near Eastgate Place (roads and private property)			
A2.27	W Fir	5th Ave, SE corner			
A2.28	W Fir	Between 5th and Sequim Ave			
A2.29	E Hammond St	Between S Brown and S Still Rd			
A2.30	W Hammond St	S 3rd Place			
A2.31	Happy Valley Rd	Bell Creek culvert at UGA boundary			
A2.32	N Honeycomb Circle	Deseret intersection, SW corner			
A2.33	W McCurdy Rd	S 5th, east end of McCurdy -- runoff flows overland to east			
A2.34	Miller Rd	Starting from Doe Run			
A2.35	Miller Rd	Emerald Highlands			
A2.36	Miller Rd	Luis property (744 Miller Rd)			
A2.37	Norman	Along length, various addresses			
A2.38	Oak Wood Dr	685 Oak Wood Dr			
A2.39	Reservoir Rd	West of 3rd			
A2.40	Reservoir Rd	Highland ditch culvert around 400 Reservoir Rd			
A2.41	N Rhodefer	West Sequim Bay Rd			
A2.42	S Rhodefer	E Washington			
A2.43	Seal Street	South end, between Cedar and Washington			

City-Owned Properties (continued) (refer to Appendix A2 information)					
Problem #	**Street**	**Cross Street/Location**	**Risk (H, M, L)**	**Priority (#)**	**Notes**
A2.44	N Sequim Ave	Fir, NW corner			
A2.45	N Sequim Ave	Hendrickson, NW corner			
A2.46	N Sequim Ave	Spruce, SE corner			
A2.47	S Sequim Ave	Hammond corner			
A2.48	S Sequim Ave	Prairie, SE corner			
A2.49	E Silberhorn	Just east of River Rd			
A2.50	E Silberhorn	East of Petal Lane where ditch from south comes out, across from 693 E Silberhorn			
A2.51	E Silberhorn	Rolling Hills			
A2.52	Spyglass/Wash Harbor Loop	North end of Simdars			
A2.53	W Spruce St	Just west of 5th, south and north side past Fire Station back driveway			
A2.54	W Washington	Home Depot, etc.			
A2.55	E Washington	Still-Hammond Rd intersection			
A2.56	E Washington	East of S Rhodefer			
A2.57	West Sequim Bay Rd	Between Rhodefer and Washington Harbor Rd (near Elk Loop)			
A2.58	West Sequim Bay Rd	Fairweather			
A2.59	West Sequim Bay Rd	West end near Washington			
A2.60	West Sequim Bay Rd	Middle section east of Wash. Harbor Rd			
A2.61	Simdars-Spyglass/Wash Harbor Loop intersection	Wash DOT pond			

Misconnected Street Drains (refer to Appendix A3 photos and information)				
Problem #	**Street and Location**	**Risk (H, M, L)**	**Priority (#)**	**Notes**
A3.01	Seal Street between Cedar and Alley			
A3.02	N 7th (W shoulder and parking lot for flooring business)			
A3.03	S 7th, west side at Eureka ditch crossing (at Sawadee parking lot)			
A3.04	S 7th, east side at Eureka ditch crossing (at south property line of McDonalds)			
A3.05	W Washington at Columbia Bank corner, both sides entrance to parking lot			
A3.06	W Washington at Safeway complex			
A3.07	Sequim Ave at Washington intersection (SE and NE)			