City of Des Moines 2015 Surface Water Comprehensive Plan

Prepared for
City of Des Moines
21630 11th Ave South
Des Moines, WA 98198

March 2015

Prepared by
Parametrix
719 2nd Avenue, Suite 200
Seattle, WA 98104
206.394.3700
www.parametrix.com

216-1792-009 (01/05)

Citation

Parametrix. 2015. City of Des Moines 2015 Surface Water Comprehensive Plan. Prepared by Parametrix, Seattle, Washington. March 2015.

Certification

The technical material and data contained in this document were prepared under the supervision and direction of the undersigned, whose seal, as a professional engineer licensed to practice as such, is affixed on this page.

Prepared by Julie Brandt, P.E.
Senior Surface Water Engineer

Checked by Paul Fendt, P.E.
Surface Water Group Lead

Approved by Austin Fisher, P.E.
Project Manager

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Acronyms and Abbreviations

B

BMP
best management practice

C

CCTV
closed-circuit television
CMP
corrugated metal pipe
City
City of Des Moines

D

DMMC
Des Moines Municipal Code

E

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

F

FTE
full-time employee

G

GIS
geographic information system

I

IDDE
Illicit Discharge, Detection and Elimination (Program)

L

LID
low impact development

N

NPDES
National Pollutant Discharge Elimination System
NPDES Permit
Western Washington Phase II Municipal Stormwater Permit

R

RSMP
Regional Stormwater Monitoring Program

S

SEPA
State Environmental Policy Act
SR
State Route
Surface Water CIP
Surface Water Capital Improvement Plan
SWCP
surface water comprehensive plan
SWM
Surface Water Management Division
SWMP Plan
NPDES Stormwater Management Program Plan

W

WRIA
Water Resource Inventory Area

Executive Summary

Plan Goals and Development

Purpose

The City of Des Moines Surface Water Management Division is responsible for implementing practices and technologies to address stormwater-related issues throughout the city. The Surface Water Management Division's mission is to:

- Control and minimize flooding, erosion, sedimentation, and water quality degradation;
- Protect the stream ways and wetlands within the city limits;
- Accommodate future urban growth and correct existing surface water problems; and
- Safeguard public safety, prevent property damage, and improve water quality.

(DMMC 11.08.010)

The purpose of this surface water comprehensive plan (SWCP) is to outline the City's surface water management program that will be implemented over the next 10 years, including the current Washington State Department of Ecology (Ecology) Municipal Stormwater Permit term (2013–2018), and discuss the steps taken to identify the crucial program elements. Two major components of the SWCP are the Surface Water Capital Improvement Plan and the Surface Water Rate and General Facilities Charge Update Analysis, which are discussed in the Program Recommendations section of this summary.

Methodology

The City's current surface water program was evaluated and summarized through review of existing operational, water quality, flood control, and habitat reports and

data within the City records and other publicly available resources. In addition, existing surface water issues, potential capital projects, staffing needs, maintenance effectiveness, pollution sources, and public awareness were identified and prioritized based on City staff questionnaires, a City staff workshop, five public meetings enlisting citizen involvement, and three presentations to the City Council Environment Committee.

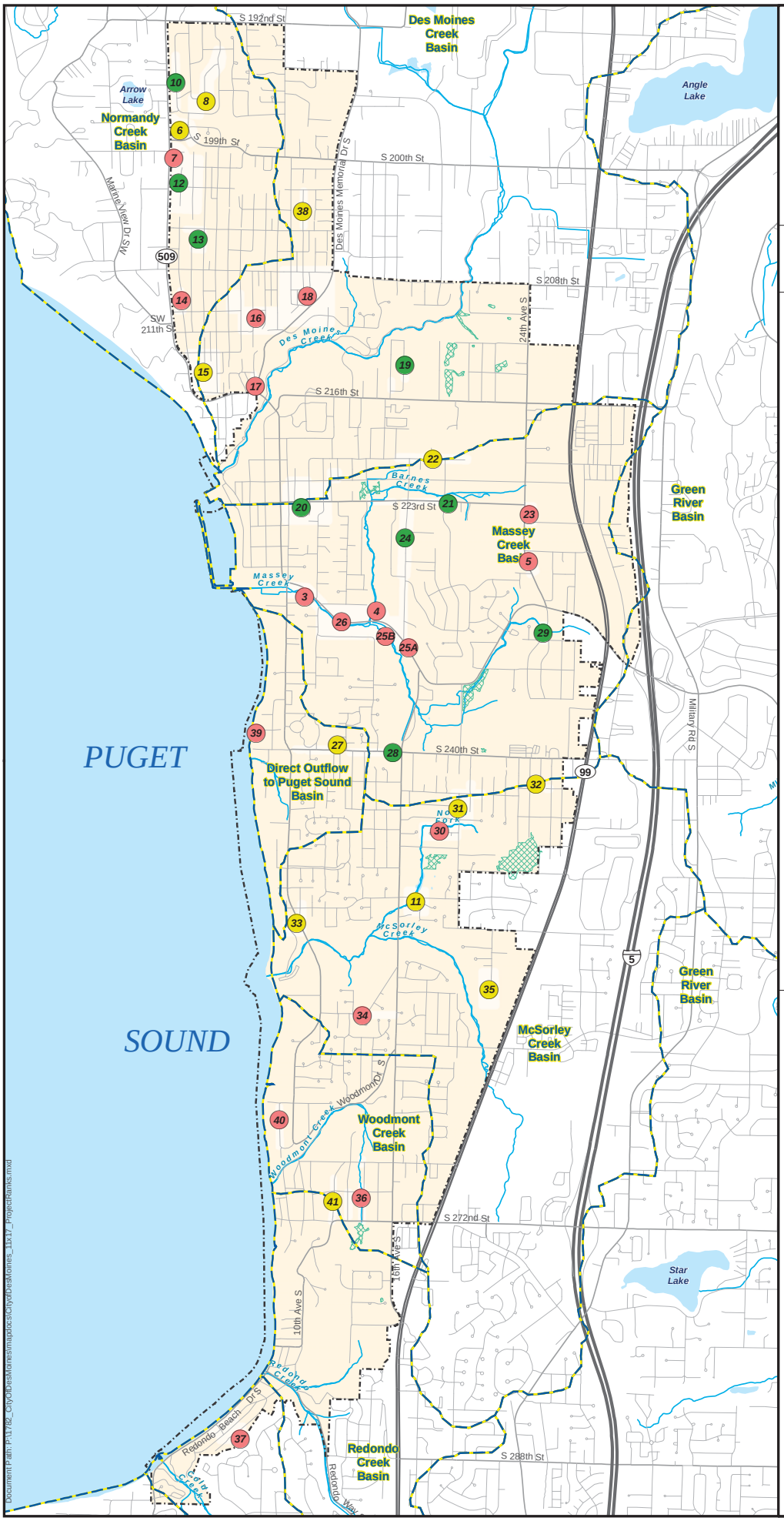
The current surface water management program was evaluated based on City and state regulatory requirements, feedback from the City, and public participation. The program was evaluated to determine where the current level of service did not fully meet with existing program expectations. In addition, recommendations for higher levels of service were developed based on future City goals and additional programs or technologies that would increase the efficiency of the current program and potentially reduce long-term costs. To objectively compare and prioritize potential capital projects, a ranking system was developed based on City input, citizen involvement, and feedback from the City Council Environment Committee. Finally, the surface water rate analysis was conducted by developing and evaluating three different scenarios that would each address a baseline level of service compliant with all regulatory requirements, combined with different levels of operational efficiencies and completion of capital projects.

Future Updates

This SWCP provides a snapshot of the stormwater management program as it can be assessed from a 2014 perspective; however, changes and influence from external (e.g., regulations) and internal (e.g., change in staff or elected officials, flood events) events will occur. The program status should be briefly reviewed bi-annually, reconfirmed for adjustments due to the NPDES Permit renewal in 2018, and a status report and possible adjustments prepared at the 5-year mark (2020) to determine progress toward achieving goals in its 10-year time frame.

Study Area

The city of Des Moines is located within eight stream basins that are part of the larger Duwamish/Green Watershed (Figure ES-1). Waterbodies within these basins include Des Moines Creek, Massey Creek, Barnes Creek, McSorley Creek, Normandy Creek, Woodmont Creek, Redondo Creek, and Cold Creek, all of which drain directly to Puget Sound. Issues identified in each stream basin within the city and summarized below are based on findings of individual basin plans; however, substantial efforts have been made to address these issues since publication of the original basin plans and additional monitoring may be needed to determine the success of these efforts.



City of Des Moines

Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

Capital Project and Rank
- High
- Medium
- Low

Project Area

Stream

Drainage Basin

Wetland

Des Moines City Limits

N

500 0 500 1,000
Scale in Feet

Source: City of Des Moines, King County

Figure ES-1

Drainage Basins and Capital Project Locations

Des Moines Surface Water Comprehensive Plan

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Des Moines Creek, Massey Creek, and McSorley Creek have characteristics in common. Each of these streams experiences varying levels of localized flooding due to uncontrolled runoff from developed areas and inadequate detention storage. In addition, each stream contains a combination of varying habitat quality, though good fish habitat still exists in many streams and some reaches may be suitable for restoration. Also, Des Moines Creek, Massey Creek, and McSorley Creek have been identified on Ecology's 303(d) list for exceeding state water quality standards for dissolved oxygen, fecal coliform bacteria, and copper. Des Moines Creek and Massey Creek have also been identified on Ecology's 303(d) list for exceedances of the zinc water quality standard.

The remaining streams within the city are each considered to have lower habitat value. Both Normandy Creek and Woodmont Creek have good canopy cover; however, Normandy Creek contains fish barriers and Woodmont Creek is heavily incised by high flows. Redondo Creek and Cold Creek basins are each heavily developed with less remaining canopy cover and offer very low habitat value overall. Normandy, Woodmont, Redondo, and Cold creeks have not been listed by the state for water quality exceedances.

Current Surface Water Management Program

Overview

An overview of the current Surface Water Management Program is provided in Table ES-1.

Budgeting

The current surface water management program is funded through a surface water utility fee, grants, and Interlocal agreements. The Surface Water Management Division periodically evaluates the surface water fee to determine if the base amount is adequate to meet program needs and if the portions of the rates allocated between commercial and residential customers is appropriate. In addition, the Surface Water Management Division generates an annual budget outlining how the surface water rate revenue will be allocated to its costs and needs for the coming year.

Table ES-1. Overview of Current Surface Water Management Program

<table>
<tr><th colspan="10">Program Element and Associated Costs</th></tr>
<tr><td>Planning and Engineering</td><td>Inspections and Maintenance</td><td colspan="7">NPDES</td><td>Administration</td><td>Capital Projects</td></tr>
<tr><td rowspan="2">Staff salaries, supplies, and specific labor required for stormwater engineering and planning (Stormwater Comprehensive Plan, NPDES SWMP Plan, etc.).</td><td rowspan="2">Routine system inspections and maintenance (includes NPDES-required work): field crew staff salaries, equipment, interfund transfers for repairs, etc.</td><td colspan="7">Implementation of NPDES Permit program
● SWMP document updates included under Planning and Engineering
● NPDES inspections and maintenance included under Inspections and Maintenance general program component</td><td rowspan="2">Overhead costs of operating the program: support staff salaries, state taxes, utility taxes, and non-element-specific expenses.</td><td rowspan="2">Large-scale construction, expansion, renovation, or replacement projects; purchases of major, long-term use equipment; or major long-term maintenance, repair, or rehabilitation projects.</td></tr>
<tr><td>Public Education</td><td>Public Involvement</td><td>Illicit Discharges</td><td>Control Runoff</td><td>Operation and Maintenance</td><td>Monitoring</td><td>Tracking and Reporting</td></tr>
<tr><td></td><td></td><td>Reduce or eliminate public stormwater impacts and encourage participation in stewardship.</td><td>Ongoing opportunities for involvement, such as advisory councils, public hearings, watershed committees, and rate-structure input.</td><td>Prevent, detect, characterize, trace, and eliminate illicit connections and discharges into the storm drain system.</td><td>Reduce pollutants in stormwater runoff from new development, redevelopment, and construction site activities through permitting, plan review, and inspections.</td><td>Perform operation and maintenance on the storm drain system and provide staff training.</td><td>Conduct local water quality monitoring or pay into a fund to support regional monitoring.</td><td>Gather information, track program success, set action priorities, retain records, and submit reports to Ecology.</td><td></td><td></td></tr>
</table>

Identified Compliance Gaps in Current Program

In general, the current surface water management program complies with most regulatory requirements and provides an adequate level of service to the surface water rate customers. However, the following gaps were identified in the existing program:

- **NPDES Operation and Maintenance**: Stormwater management facilities must be inspected at least once per year. The City crews are able to inspect each existing facility annually and upgrade them to maintenance standards as needed. However, since 2012, at least four major facilities have been constructed or soon will be. The Surface Water Management Division is in the process of modifying operation and maintenance procedures to include these facilities and have maintenance crews provide these inspection duties. With the existing maintenance staff, a gap exists in the time needed to meet the permit inspection and maintenance requirements as additional facilities are constructed.
- **NPDES Tracking, Recordkeeping, and Reporting**: The existing inspection and maintenance records contain a large backlog of paper activity reports that have not been entered into the electronic database.
- **Capital Project Implementation**: The City currently does not have an emergency fund within the capital projects budget or a systematic program for replacement of failing infrastructure.

Program Recommendations

Key Drivers

The Surface Water Management Division's mission statement focuses on issues such as flooding, erosion, sedimentation, water quality degradation, stream and wetland protection, future growth, public safety, and property protection. All of these elements are part of three main focus areas around which the Surface Water Management Program is centered:

- Drainage
- Water Quality
- Habitat

Future program upgrades centered on these focus areas will provide continuity of efforts while aligning with local and state requirements, regional initiatives, City goals and priorities, and public needs.

The City's existing storm drain system and flow control facilities are generally adequate to address drainage needs to the level of service in place when the

systems were constructed. However, the infrastructure within the storm drain system includes extended lengths of pipe that are near the end of their useful life and the Surface Water Management Division does not currently have a dedicated plan or funding mechanism to pay for the repair and replacement of these aged components. It is recommended that the City establish a repair and replacement fund to handle these anticipated, but unpredictable, repairs of pipe failure.

Based on recent regulatory developments, it is anticipated that future versions of the Municipal NPDES Permit will require the City to develop a stormwater retrofit plan. It is recommended that the City begin preparing for the future potential need by compiling and organizing information related to stormwater quality and flow retrofitting, mapping, water quality problem identification and tracking, and flow monitoring. In addition, the City should consider establishing funding for add-on opportunities and preparing a prioritized retrofit plan.

Similar to water quality data, the City does not have a central clearinghouse of information for City habitat areas and improvement opportunities. Therefore, it is recommended that the City begin compiling and organizing habitat-specific information as part of the data gathering effort discussed above.

Components

Recommended approaches for addressing gaps in the current surface water management program, including additions of full-time employees, and recommendations to increase program efficiencies and reduce costs are presented in Table ES-2.

Implementation

Implementation of the recommended operational procedures and construction of capital projects are presented in four different funding scenarios, as summarized in Table ES-3. Each of these scenarios would address a baseline level of service compliant with all regulatory requirements. Scenarios 3 and 4 are combined with different levels of operational efficiencies and completion of capital projects. Identified capital projects are summarized in Figures ES-1 and ES-2.

Tables ES-4 through ES-7 show the long-term revenue requirement forecast and the associated utility fee increase for each of the scenarios. The rate of fee increases in Scenario 1 are based on inflation only; while Scenarios 2, 3, and 4 include increases beyond inflation to achieve higher levels of operational and capital service.

Implementation of Scenario 3 is recommended. This scenario would provide the additional necessary maintenance staff to comply with regulatory inspection and maintenance requirements for the expanding drainage system, would maintain the popular and successful Voluntary Pipe Program, and would enable the City to complete all 19 High Priority capital projects over the next 10 years.

Table ES-2. Surface Water Management Program Findings and Recommendations

	Program Element										
Findings	Planning and Engineering	Maintenance	NPDES							Administration	Capital Improvement Program
			Public Education	Public Involvement	Illicit Discharge	Control Runoff	Operation and Maintenance	Monitoring	Tracking and Reporting		
Gaps in Existing Program and Compliance Needs	● None	● Crews inspecting approximately 60% of all catch basins annually. ● Add 0.33 FTE, maintenance: necessary for required annual inspections of the expanding drainage system	● None	● None	● None	● None	● 2 to 3 public facilities added each year, requiring additional staff to meet permit requirements ● Add 0.33 FTE, increase inspection coverage	● None	● Inspection and maintenance database not current with most recent activities. ● Add 0.33 FTE, input records backlog	● None	● Maintenance of all stormwater facilities required by DMMC 11.20.080 (2)(a). ● No current systematic repair or replacement of aging capital assets ● Add emergency repair and replacement service account.
Recom-mendations	● Programmatic SEPA evaluation of Capital Program ● Project Management Manual/ training to support Capital Program ● Add 1.0 FTE to manage Capital Program ● Charge drainage permit fee, help fund development support	● Closed-circuit television inspection of 15% of the drainage system annually until complete (City to purchase equipment: $15k) ● Use City staff to help implement portion of the CMP Replacement capital project.	● None	● None	● None	● None	● None	● None	● Update tracking database to electronic software. ● Organize water quality retrofit data.	● Increase budget proportionately to support upgrades of other program elements ● Track division revenue growth, use proceeds to cover new costs	● None

FTE = full-time employee; SEPA = State Environmental Policy Act; DMMC = Des Moines Municipal Code; NPDES = National Pollutant Discharge Elimination System; CMP = Corrugated Metal Pipe

Table ES-3. Program Implementation Funding Scenarios

Funding Scenario	Operations	Capital Projects Funded by 2025
Scenario 1	**Additional Revenue:** • Establish Drainage Permit Fee • Street Fund charge for waste disposal • Transition Engineering Staff to deliver CIP **Additional Cost:** • 1.0 FTE (maintenance) in 2015 **Utility Fee:** No change beyond inflation	**High Priority:** 13 of 19, with at least 6 delayed until 2023 **Medium Priority:** 0 of 12 **Voluntary Pipe Program:** Reduction or complete elimination
Scenario 2	**Additional Revenue:** • Establish Drainage Permit Fee • Street Fund charge for waste disposal • Transition Engineering Staff to deliver CIP **Additional Cost:** • 1.0 FTE (maintenance) in 2015 **Utility Fee:** Smallest increase compared to other scenarios	**High Priority:** 14 of 19 **Medium Priority:** 0 of 12 **Voluntary Pipe Program:** Existing program maintained
Scenario 3 **RECOMMENDED**	**Additional Revenue:** • Establish Drainage Permit Fee • Street Fund charge for waste disposal • Transition Engineering Staff to deliver CIP **Additional Costs:** • 1.0 FTE (maintenance) in 2015 • 1.0 FTE (engineer) to manage expanding CIP as growth permits (estimated 2021) **Utility Fee:** Medium increase compared to other scenarios	**High Priority:** 19 of 19 **Medium Priority:** 0 of 12 **Voluntary Pipe Program:** Existing program maintained
Scenario 4	**Additional Revenue:** • Establish Drainage Permit Fee • Street Fund charge for waste disposal • Transition Engineering Staff to deliver CIP **Additional Costs:** • 1.0 FTE (maintenance) in 2015 • 1.0 FTE (engineer) in 2015 **Utility Fee:** Highest increase compared to other scenarios	**High Priority:** 19 of 19 **Medium Priority:** 12 of 12 **Voluntary Pipe Program:** Existing program maintained

Capital Project	Public Meeting Focus Area	Project Title	Estimated Cost	Score
High-Ranked Projects				
16	**A**	5th Avenue South/212th Street Pipe Upgrade	$724,220	**68**
3	**B**	Lower Massey Creek Channel Modifications	$1,248,565	**64**
30	**C**	North Fork McSorley Creek Diversion Project	$372,960	**60**
4	**B**	Barnes Creek/Kent Des Moines Road Culvert Replacement	$1,470,081	**58**
39	**C**	6th Avenue/239th St. Pipe Replacement	$164,220	**56**
36	**D**	14th Avenue (268th to 272nd) Pipe Upgrade	$411,740	**56**
17	**A**	216th Place/Marine View Drive Pipe Upgrade	$258,300	**54**
25A	**B**	KDM/16th Avenue Pipe Replacement Project	$227,080	**52**
18	**A**	Des Moines Memorial Drive - S. 208th to S. 212th Pipe Project	$504,980	**48**
40	**D**	8th Avenue (264th to 265th) Pipe Project	$219,800	**48**
5	**B**	24th Avenue Pipeline Replacement	$260,100	**46**
25B	**B**	KDM/16th Avenue (228th to KDM Rd) Pipe Project	$714,420	**46**
7	**A**	1st Avenue Pond Expansion	$334,672	34
9	**ALL**	Pipe Replacement Program (unidentified projects)	$1,474,667	34
		Sub-Total Estimated Cost of High-Ranked Projects	$8,385,805	
26	**C**	232nd Street (10th to 14th) Pipe Project	$496,580	44
23	**B**	24th Avenue (223rd to 224th) Pipe Upgrade	$226,100	42
34	**C**	258th Street (13th Pl to 16th Ave) Pipe Project	$341,600	42
37	**D**	6th Place/287th Street Pipe Replacement Project	$496,300	40
14	**A**	1st Place South (209th to 210th) Pipe Project	$211,260	36
		Sub-Total Estimated Cost of High-Ranked Projects	$1,771,840	
		Grand Total Estimated Cost of High-Ranked Projects	**$10,157,645**	
Medium-Ranked Projects				
38	**A**	9th Avenue (202nd to 206th) Pipe Project	$185,920	32
15	**A**	3rd Avenue South (213th to 216th) Pipe Project	$322,140	30
31	**C**	20th Avenue/243rd Street Pipe Upgrade	$371,840	30
35	**C**	22nd Avenue Outfall Project	$191,380	28
6	**A**	199th North Hill Trunkline Upgrade	$231,395	26
8	**A**	North Hill NE and 197th Street Trunkline Upgrade	$482,857	26
32	**C**	242nd Street (26th Ave to 26th Pl) Pipe Project	$100,100	26
11	**C**	Saltwater Highlands Tract A pond replacement (and/or stabilize adjacent rav	$360,962	24
27	**C**	240th Street (MVD to 11th Place) Pipe Project	$343,840	24
22	**A**	220th Street (15th Ave to SJU Park) Pipe Replacement Project	$335,860	22
33	**C**	252nd Street/9th Avenue Pipe Project	$191,240	22
41	**D**	12th/13th Avenue (270th to 272nd Street)	$496,020	22
		Total Estimated Cost of Medium-Ranked Projects	**$3,613,554**	
Low-Ranked Projects				
12	**A**	1st Place South (201st to 204th) Pipe Upgrade	$415,100	20
20	**A**	222nd/223rd 8th Avenue to 11th Avenue Pipe Project	$472,220	18
21	**B**	223rd Street (13th Avenue to 19th Avenue) Pipe Project	$292,880	16
28	**B**	240th Street (13th to 16th Ave) Pipe Project	$248,080	16
29	**B**	25th Avenue (n/o 232nd Street) Pipe Replacement Project	$99,680	16
10	**A**	1st Place South (197th to 192nd)	$237,860	14
19	**A**	14th Avenue/15th Avenue N/O 215th Place Pipe Project	$110,600	14
24	**B**	16th Avenue (224th to 228th) Pipe Project	$331,240	14
13	**A**	3rd Avenue (206th to 207th) Pipe Project	$165,060	10
		Total Estimated Cost of Low-Ranked Projects	**$2,372,720**	

Figure ES-2
Capital Project Cost, Priority, and Scoring Summary

Table ES-4. Scenario 1 Revenue Requirement Forecast

Scenario 1	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Rate Revenue	$ 2,511,145	$ 2,619,044	$ 2,692,678	$ 2,768,383	$ 2,846,216	$ 2,926,237	$ 3,008,508	$ 3,093,093	$ 3,180,055	$ 3,269,462
Rate Funded Capital	$ 482,133	$ 753,344	$ 861,904	$ 480,829	$ 686,728	$ 733,092	$ 781,559	$ 862,297	$ 854,204	$ 876,814
Rate Increases	**3.65%**	**2.30%**	**2.30%**	**2.30%**	**2.30%**	**2.30%**	**2.30%**	**2.30%**	**2.30%**	**2.30%**
Monthly Rate / EBU	**$ 14.76**	**$ 15.10**	**$ 15.45**	**$ 15.80**	**$ 16.17**	**$ 16.54**	**$ 16.92**	**$ 17.31**	**$ 17.70**	**$ 18.11**

Table ES-5. Scenario 2 Revenue Requirement Forecast

Scenario 2	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Rate Revenue	$ 2,511,145	$ 2,662,566	$ 2,782,914	$ 2,880,734	$ 2,961,726	$ 3,044,995	$ 3,130,605	$ 3,218,622	$ 3,309,113	$ 3,402,149
Rate Funded Capital	$ 482,133	$ 552,452	$ 723,629	$ 550,925	$ 712,569	$ 731,197	$ 750,349	$ 860,827	$ 822,469	$ 844,187
Rate Increases	**3.65%**	**4.00%**	**4.00%**	**3.00%**	**2.30%**	**2.30%**	**2.30%**	**2.30%**	**2.30%**	**2.30%**
Monthly Rate / EBU	**$ 14.76**	**$ 15.35**	**$ 15.96**	**$ 16.44**	**$ 16.82**	**$ 17.21**	**$ 17.60**	**$ 18.01**	**$ 18.42**	**$ 18.85**

Table ES-6. Scenario 3 (RECOMMENDED) Revenue Requirement Forecast

Scenario 3	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Rate Revenue	$ 2,511,145	$ 2,713,770	$ 2,890,979	$ 3,079,760	$ 3,280,868	$ 3,462,136	$ 3,653,419	$ 3,756,135	$ 3,861,739	$ 3,970,311
Rate Funded Capital	$ 482,133	$ 602,675	$ 701,305	$ 859,474	$ 1,004,726	$ 1,099,878	$ 1,175,194	$ 1,109,492	$ 1,176,840	$ 1,208,522
Rate Increases	**3.65%**	**6.00%**	**6.00%**	**6.00%**	**6.00%**	**5.00%**	**5.00%**	**2.30%**	**2.30%**	**2.30%**
Monthly Rate / EBU	**$ 14.76**	**$ 15.65**	**$ 16.58**	**$ 17.58**	**$ 18.63**	**$ 19.57**	**$ 20.54**	**$ 21.02**	**$ 21.50**	**$ 21.99**

Table ES-7. Scenario 4 Revenue Requirement Forecast

Scenario 4	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Rate Revenue	$ 2,511,145	$ 2,841,778	$ 3,170,145	$ 3,536,455	$ 3,874,010	$ 4,204,850	$ 4,479,427	$ 4,605,366	$ 4,734,846	$ 4,867,966
Rate Funded Capital	$ 458,026	$ 477,118	$ 859,907	$ 1,127,849	$ 1,429,218	$ 1,638,344	$ 1,900,134	$ 1,976,154	$ 2,030,308	$ 2,085,984
Rate Increases	**3.65%**	**11.00%**	**11.00%**	**11.00%**	**9.00%**	**8.00%**	**6.00%**	**2.30%**	**2.30%**	**2.30%**
Monthly Rate / EBU	**$ 14.76**	**$ 16.38**	**$ 18.19**	**$ 20.19**	**$ 22.00**	**$ 23.76**	**$ 25.19**	**$ 25.77**	**$ 26.36**	**$ 26.97**

EBU = equivalent billing unit, which represents number of customers

1 Introduction

1.1 Background

In developed areas such as Des Moines, the addition of impervious surfaces (hard surfaces such as roads, parking lots, sidewalks, and rooftops) has reduced the amount of rainwater that can soak into the ground compared to its natural condition. The resulting increased stormwater runoff volumes can increase the potential for landslides on steep slopes, erode natural stream banks, damage fish-spawning habitat, and increase flooding in low-lying areas. In addition, stormwater runoff accumulates pollutants such as sediment, metals, and oil and grease from built areas; various chemicals from drips and spills on industrial sites; soil and other materials from construction sites; and fertilizers and pesticides from landscaped areas where these substances are used. These pollutants are carried by the stormwater runoff to nearby streams, wetlands, and Puget Sound where they can affect water quality and endanger fish and wildlife.

Many practices and technologies have been developed that help reduce stormwater runoff volumes, safely convey stormwater to natural water bodies, prevent pollutants from collecting in stormwater, and remove the pollutants entrained in stormwater. The City of Des Moines (City) Surface Water Management (SWM) Division is responsible for implementing such practices and technologies to address stormwater-related issues throughout the city. SWM's mission is to:

- Control and minimize flooding, erosion, sedimentation, and water quality degradation;
- Protect the stream ways and wetlands within the city limits;

- Accommodate future urban growth and correct existing surface water problems; and
- Safeguard public safety, prevent property damage, and improve water quality.

(Des Moines Municipal Code 11.08.010)

SWM develops and implements stormwater management programs based on public safety; complies with city, state, and federal requirements; participates in regional initiatives; and responds to citizen feedback. SWM is part of the City's Planning, Building, and Public Works Department and shares staff with the Engineering Division to support these programs. SWM is funded through a stormwater property tax that is administered by King County. King County acts as a collection agency on behalf of the City and redistributes the stormwater fees back to SWM on a monthly basis.

1.2 Regulatory Context

Regulatory requirements that directly govern SWM's program development and implementation are highlighted in the following sections.

1.2.1 State Permit

The federal Clean Water Act contains a permit program known as the National Pollutant Discharge Elimination System (NPDES). When the United States Congress updated the Clean Water Act to include stormwater in 1987, the U.S. Environmental Protection Agency (EPA) developed rules to implement the stormwater component in phases, known as Phase I and Phase II. In general, Phase I rules apply to cities and counties serving populations greater than 100,000. The Phase II rules apply to discharges from small municipal separate storm sewers, which includes the city of Des Moines. The Washington State Department of Ecology (Ecology) implements these rules on behalf of the EPA through the NPDES municipal permit program (Ecology 2014).

The state permit that applies to Des Moines is the Western Washington Phase II Municipal Stormwater Permit (NPDES Permit; Ecology 2013), which was first issued in 2007 and subsequently renewed in 2012 and 2013. The NPDES Permit requires each permittee to develop a Stormwater Management Program that encompasses public education; public involvement; detection and elimination of illicit (non-stormwater) discharges; control of runoff from new development, redevelopment, and construction sites; operation and maintenance of the existing system; water quality monitoring program tracking; and reporting back to Ecology. The NPDES Stormwater Management Program is a subset of the City's overall surface water management program and includes specific activities, documentation, and deliverables to maintain compliance with the permit, as discussed in Chapter 3 of this plan. The NPDES Permit is typically issued on a 5-year cycle, and the current permit term ends on July 31, 2018.

1.2.2 City Codes

Sections of the Des Moines Municipal Code (DMMC) relevant to SWM's regular operations include:

11.08 Surface Water Management Program
11.12 Surface Water Utility Rates
11.20 National Pollutant Discharge Elimination System (NPDES) Program
14.20 Land Clearing and Grading
16.10 Environmentally Critical Areas
16.15 Flood Hazard Areas
16.20 Shoreline Master Program

1.3 Purpose

The purpose of this surface water comprehensive plan (SWCP) is to outline the City's surface water management program that will be implemented over the next 10 years, including the NPDES Permit term (2013–2018), and discuss the steps taken to identify the crucial program elements. A major component of the SWCP is the Surface Water Capital Improvement Plan (Surface Water CIP). The purpose of the Surface Water CIP is to identify and evaluate known issues and potential capital projects that would help to address those issues.

1.4 Plan Development Methodology

In developing the surface water management program, the City's current surface water program was summarized, existing surface water issues were identified, and potential solutions were developed based on the elements discussed below.

1.4.1 Existing Data Review

This SWCP builds on several studies that have previously evaluated the stormwater management program, water quality, and habitat conditions within Des Moines. These studies, which were reviewed as part of the SWCP development, are listed below. General geographic information system (GIS) data provided by the City were also included in the plan's development.

Surface Water Management Program

- Stormwater Rate Structure Study (FCS 20122013)
- 2012 NPDES Annual Report (Des Moines 2013a)
- 2014 Budget (Des Moines 2013c)
- 2014-2019 Capital Improvement Plan (Des Moines 2013b)
- City Fleets and Facilities Stormwater Pollution Prevention Plan (Des Moines 2010a)
- Comprehensive Plan (Des Moines 2012)

- NPDES Stormwater Management Program Plan (SWMP Plan; Des Moines 2014)
- Planning, Building, and Public Works Department Organizational Chart
- Surface Water Rate Study (FCS 2006)
- Surface Water Utility Performance Review (FCS 2004)

Water Quality

- Integrated Pest and Vegetation Management Plan (Des Moines 2009)
- Water Quality Monitoring Program (Des Moines 2001)
- Copper and Zinc Levels in Des Moines, Massey and McSorley Creeks (Ecology 20122012b)

Flood Control and Habitat

- Des Moines Creek Basin Plan (Des Moines Creek Basin Committee 1997)
- Executive Proposed Basin Plan, Hylebos Creek and Lower Puget Sound (King County 1991)
- Lower Massey Creek Alternative Analysis (Des Moines 1994)
- Massey Creek Comprehensive Flood Control Management Plan (Des Moines 1990)
- North Fork of Smith Creek Drainage Basin Study (Des Moines 1987)
- Shoreline Master Program (Des Moines 2010b)

1.4.2 Public Involvement

As part of the SWCP development, input was solicited from City staff, local residents, and elected officials to focus on the City's needs and priorities for addressing drainage, water quality, and habitat issues within the city. Existing surface water issues, potential capital projects, staffing needs, maintenance effectiveness, pollution sources, and public awareness were identified and prioritized based on City staff questionnaires, a City staff workshop, five public meetings enlisting citizen involvement, and three presentations to the City Council Environment Committee. Appendix A presents materials used in the public involvement process.

1.4.3 Surface Water Capital Improvement Plan

The Surface Water CIP was developed by identifying City and public–nominated projects recommended during public meetings. No other technical evaluations or modeling was conducted to identify projects that were not meeting levels of services or enumerated performance goals. A ranking system was developed for

the City to objectively compare and prioritize these projects as well as future projects. The project ranking criteria and scoring convention were developed based on City input, citizen involvement, and feedback from the City Council Environment Committee. Appendix B provides a detailed discussion of the Surface Water CIP and Appendix C provides details on recommended capital projects.

1.4.4 Gap Analysis

The current surface water management program was evaluated based on the regulatory requirements outlined in Section 1.2, feedback from the City, and public participation. The Program was mainly evaluated to determine where the current level of service did not fully meet with existing program expectations. In addition, recommendations for higher levels of service were developed based on future City goals and additional programs or technologies that would increase the efficiency of the current program and potentially reduce long-term costs.

1.5 Updates to this Plan

This SWCP provides a snapshot of the stormwater management program as it can be assessed from a 2014 perspective. The data availability, regulations, and value systems for prioritization reflect today's understanding of the City's stormwater program. However, changes and influence from external (e.g., regulations) and internal (e.g., change in staff or elected officials, flood events) events will occur. The program defined and described here should be briefly reviewed bi-annually for progress status, reconfirmed in 2017 and 2018 for adjustments due to the NPDES Permit renewal in 2018, and a status report and possible adjustments prepared at the 5-year mark (2019) to determine if minor adjustments are needed to keep the long-term program on target and achieving goals in its 10-year time frame.

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2 Surface Water Study Area

2.1 Overview

The SWCP study area was identified to include elements that reflect the current state of drainage, water quality, and habitat within the city boundaries. The study area comprises the area within the city boundary and includes the following components:

- Drainage: Drainage basins, flooded areas, steep slopes and topography, and geologically hazardous areas (Figures 2-1 through 2-4; Des Moines 2014).
- Water Quality: Water bodies identified on Ecology's 303(d) list of threatened and impaired water bodies (Figure 2-5), areas susceptible to groundwater contamination, and wellhead protection areas (Figure 2-6).
- Habitat: Habitat resources such as wetlands and streams (Figure 2-7) and fish and wildlife conservation areas (Figure 2-8).

2.2 Major Drainage Basins

The city of Des Moines is located within eight stream basins. Though these basins have been delineated by Ecology as part of the larger Duwamish/Green Watershed (see Figure 2-1), each of the streams that flow through the city discharge directly to Puget Sound. All surface water runoff from city roads, parking lots, parks, lawns, and other areas flows to one of these eight streams or directly to Puget Sound. Basin plans have been prepared for each of these streams, summarized in the following sections, which include discussion of drainage, flooding, water quality, and habitat. In almost every basin, substantial efforts have been made to address the issues and complete the projects identified in the basin plans. It may be appropriate to prepare a status update of the basin

plans, evaluate improvements, and potentially collect additional flow modeling and water quality monitoring data.

2.2.1 Des Moines Creek Basin

2.2.1.1 Natural Waterbodies

The Des Moines Creek Basin is approximately 3.5 miles long and includes three distinct reaches: Plateau, Ravine, and Lower; and two main branches known as the East and West Forks. In addition, there are over 30 acres of wetlands in the basin with diverse communities including emergent, forested, scrub-shrub, and open water (King County 2007). Des Moines Creek is the largest stream flowing through the city of Des Moines (Des Moines 2001). It flows from an elevation of about 350 feet (at Bow Lake) to sea level where it meets Puget Sound at Des Moines Creek Beach Park (SeaTac 2013).

2.2.1.2 Land Uses

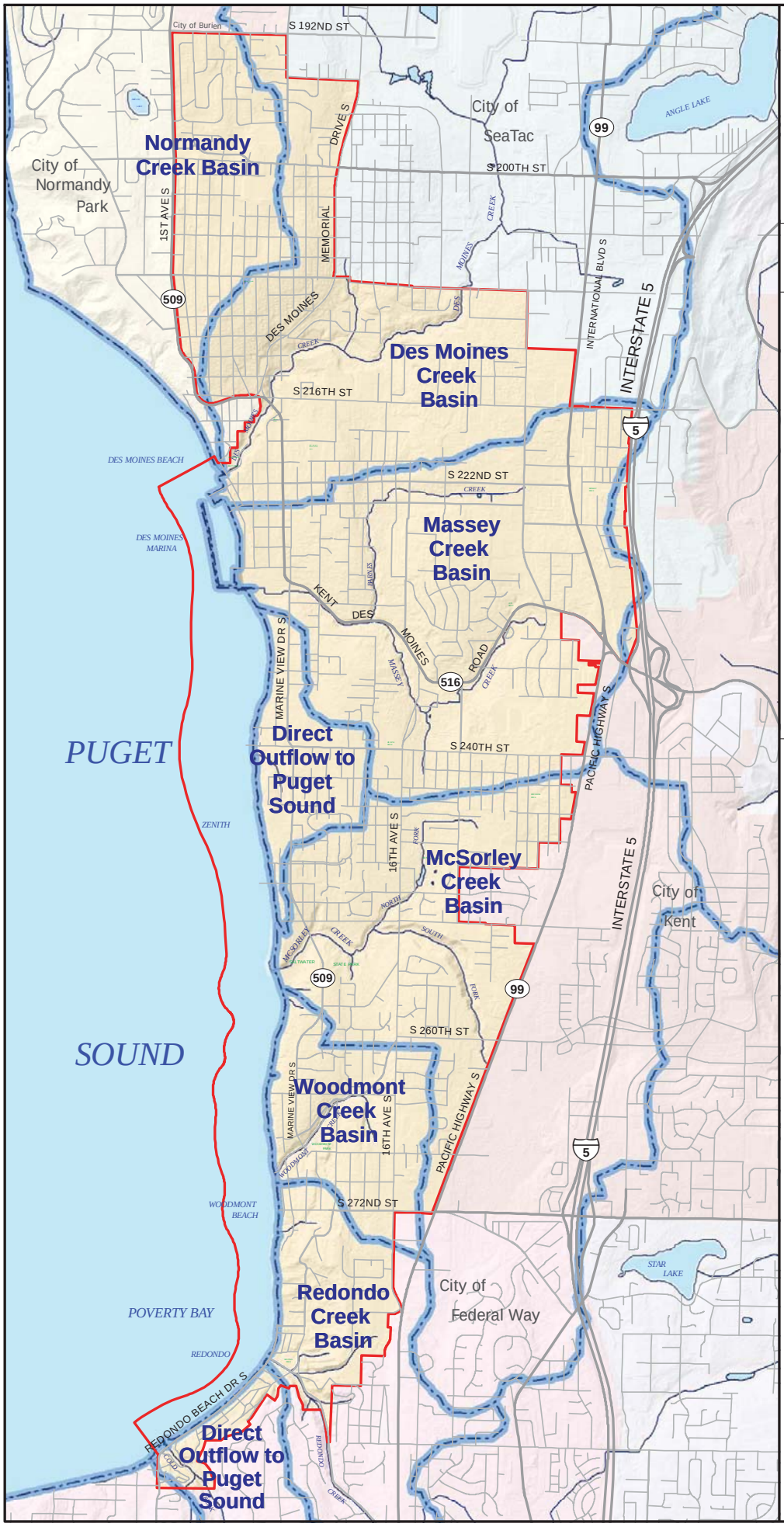
The Des Moines Creek Basin is approximately 5.8 square miles (3,700 acres) with land cover that is largely developed, including residential, commercial, and industrial uses. In addition, Seattle-Tacoma International Airport is located at the headwaters of Des Moines Creek and occupies approximately 27 percent of the total basin area (King County 2007; CH2M HILL 2003). Bow Lake, the Northwest Ponds, and Tyee Pond provide some of the major stormwater detention and treatment in the basin, although additional smaller facilities are present throughout the basin (CH2M HILL 2003).

2.2.1.3 Known Issues

Drainage and Flooding

Within the Des Moines Creek ravine reaches, the stream channel becomes confined. Here, it has limited pools and woody debris (which support insect and fish life), and it is impaired by regular high flows. Des Moines Creek has inadequate flow control measures, which lead to downstream flooding. These issues, combined with a reduced summer base flow, lead to degraded water quality and an impaired fish habitat (King County 2007).

Impervious surfaces (hard surfaces such as roads, sidewalks, parking lots, and roofs) associated with development in the watershed have increased peak runoff flows that have resulted in flooding, channel bank erosion, and scouring of spawning gravel in downstream reaches. The addition of impervious surfaces has also limited groundwater recharge and resulted in reduced summer base flows (CH2M HILL 2003).



City of Des Moines
Washington

City of Des Moines

Critical Area Map Series

Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

Generalized Drainage Basins

Surface Water

Streams

Jurisdictions

- Normandy Park
- Burien
- SeaTac
- Kent
- Federal Way
- Unincorporated King County

N

500 0 500 1,000

Scale In Feet

Source: City of Des Moines GIS
April 2007

Figure 2-1
Drainage Basins

Des Moines Surface Water
Comprehensive Plan

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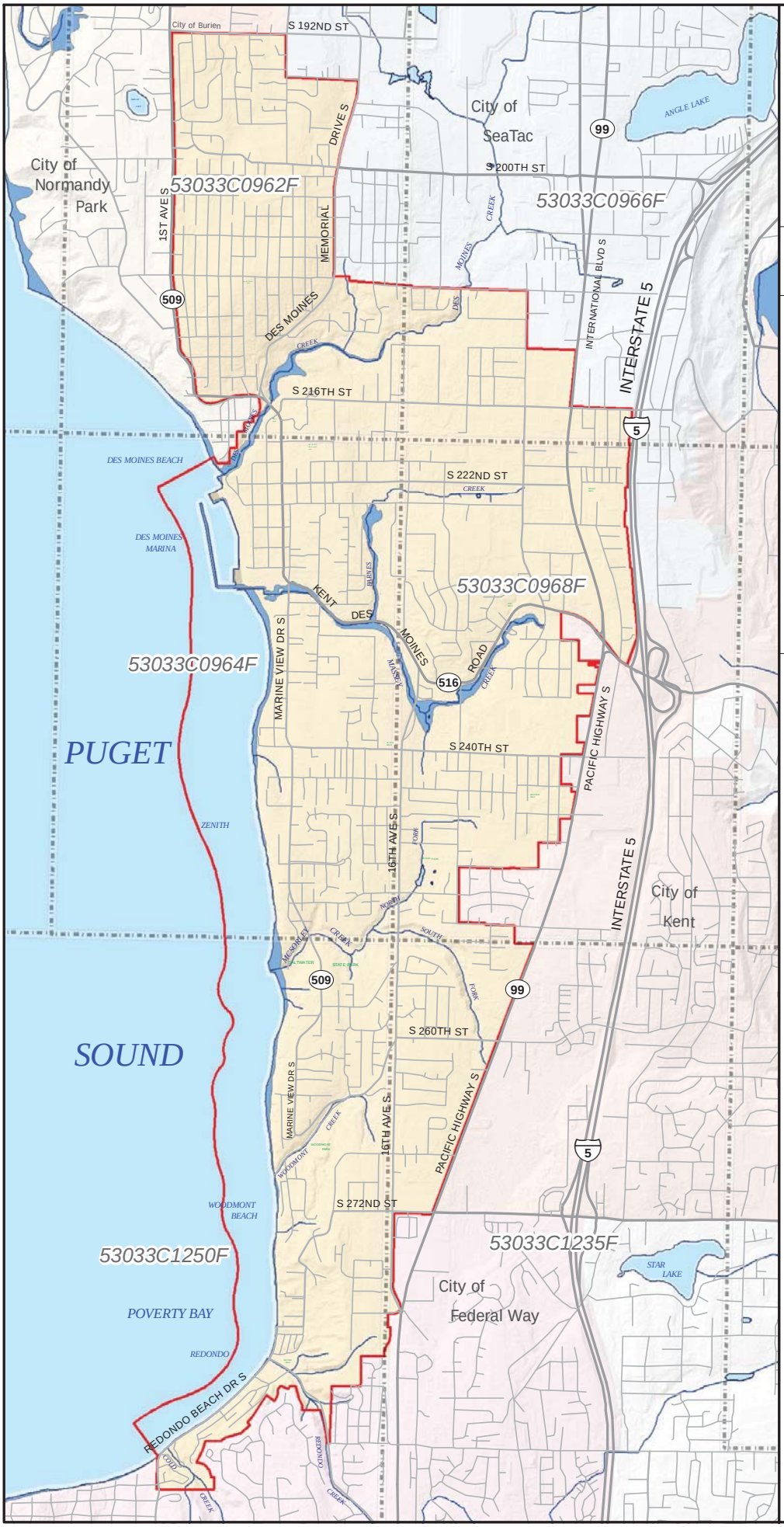

City of Des Moines
Washington

City of Des Moines

Critical Area Map Series

Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

Frequently Flooded Areas
- A
- AE
- VE

FIRM Map Boundary

Streams

Des Moines City Limits

N

500 0 500 1,000
Scale In Feet

Source: City of Des Moines GIS
April 2007

Figure 2-2
Frequently Flooded Areas

Des Moines Surface Water Comprehensive Plan

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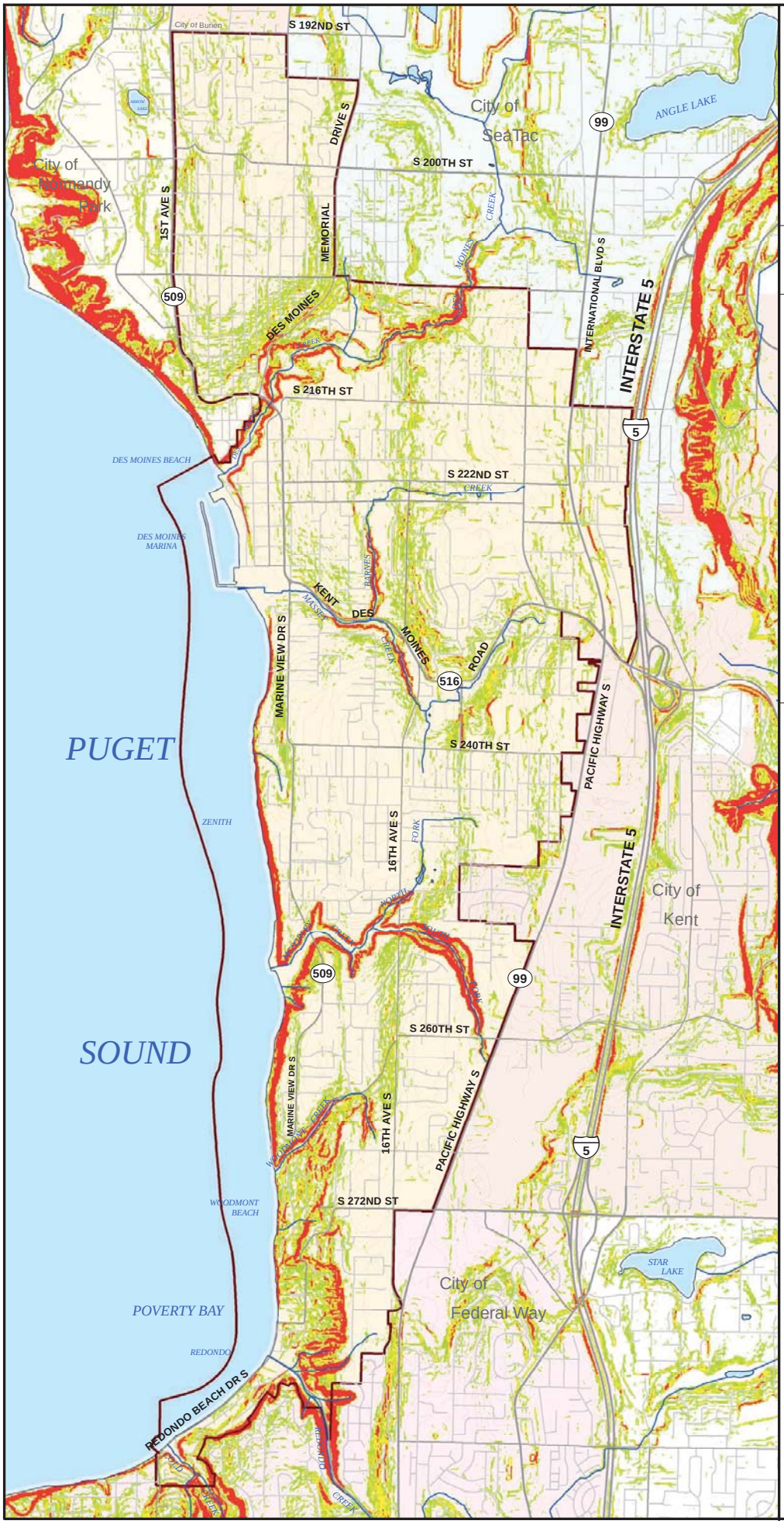

City of Des Moines
Washington

City of Des Moines

Critical Area Map Series

Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

Hillsides / Slope
- 0 - 15%
- 15 - 25%
- 25 - 45%
- 45% or Greater

Streams

Des Moines City Limits

Jurisdictions
- Normandy Park
- Burien
- SeaTac
- Kent
- Federal Way
- Unincorporated King County

N

500 0 500 1,000
Scale In Feet

Source: City of Des Moines GIS
April 2007

Figure 2-3
Slope and Topography

Des Moines Surface Water Comprehensive Plan

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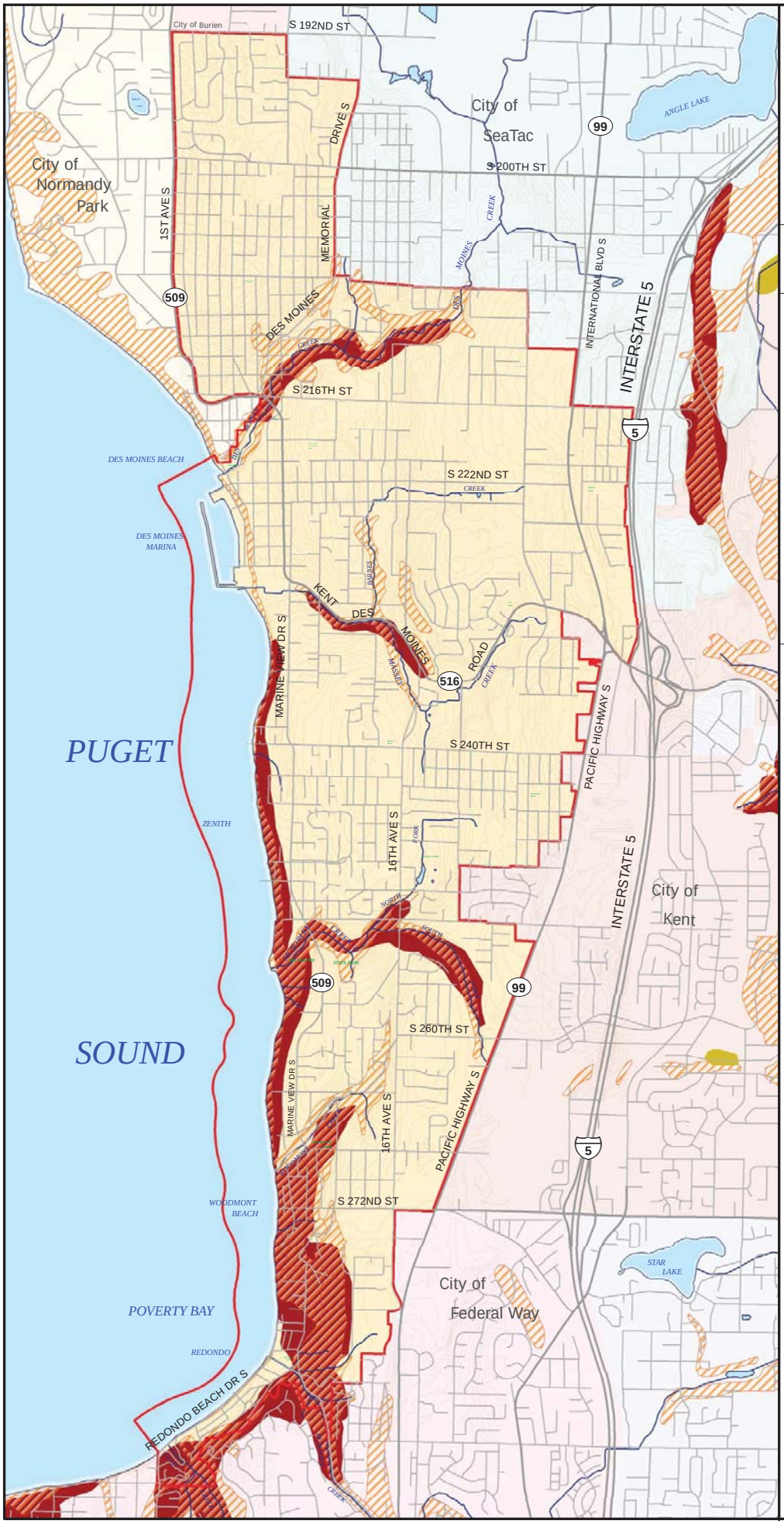

City of Des Moines
Washington

City of Des Moines

Critical Area Map Series

Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

Seismic Hazards

Erosion Hazards

Landslide Hazards

Streams

10 ft Interval Contours

N

500 0 500 1,000

Scale In Feet

Source: City of Des Moines GIS
April 2007

Figure 2-4
Geologically Hazardous Areas

Des Moines Surface Water Comprehensive Plan

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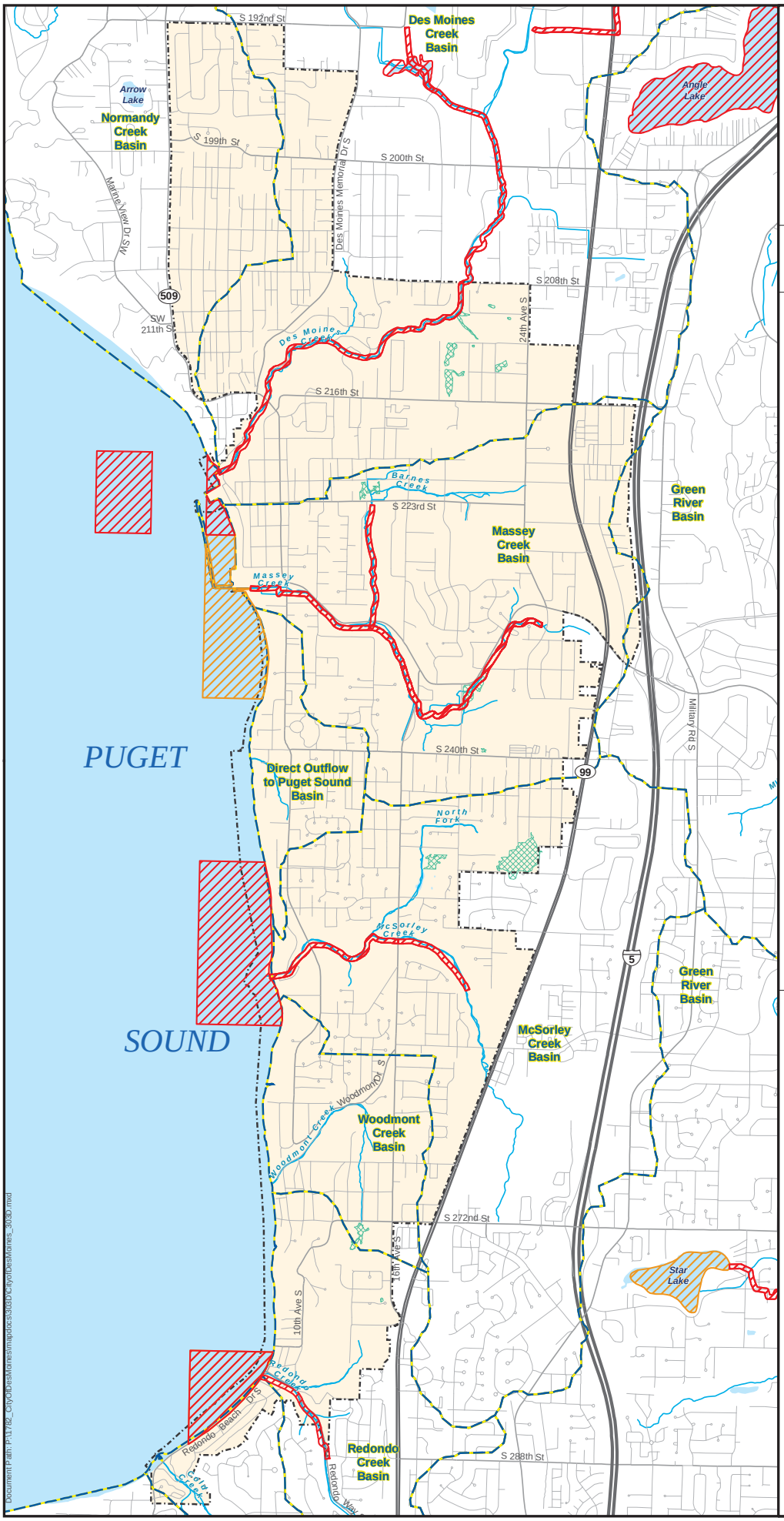

City of Des Moines
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City of Des Moines

Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

303(d) Category 5

303(d) Category 4

Stream

Drainage Basin

Wetland

Des Moines City Limits

N

500 0 500 1,000
Scale in Feet

Source: City of Des Moines, King County

Figure 2-5
Impaired Water Bodies

Des Moines Surface Water Comprehensive Plan

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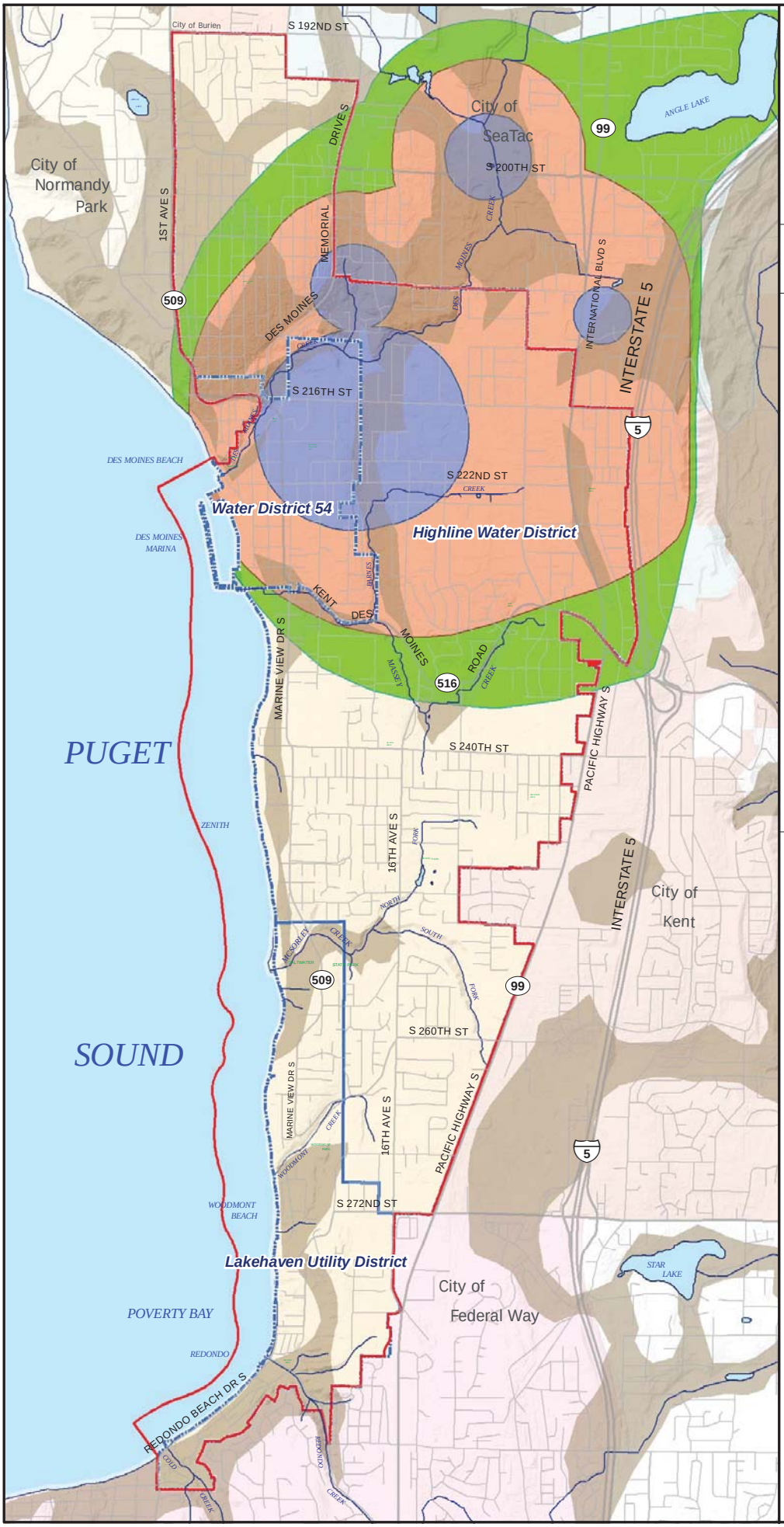

City of Des Moines
Washington

City of Des Moines

Critical Area Map Series

Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

Streams

Des Moines City Limits

Water District Boundary

Areas of High Susceptibility (King Co.)

Wellhead Protection Zones

- Class 1 - One Year
- Class 1 - 5 Year
- Class 2 - 10 Year

Jurisdictions

- Normandy Park
- Burien
- SeaTac
- Kent
- Federal Way
- Unincorporated King County

N

500 0 500 1,000

Scale In Feet

Source: City of Des Moines GIS
April 2007

Figure 2-6
Critical Aquifer Recharge Areas

Des Moines Surface Water Comprehensive Plan

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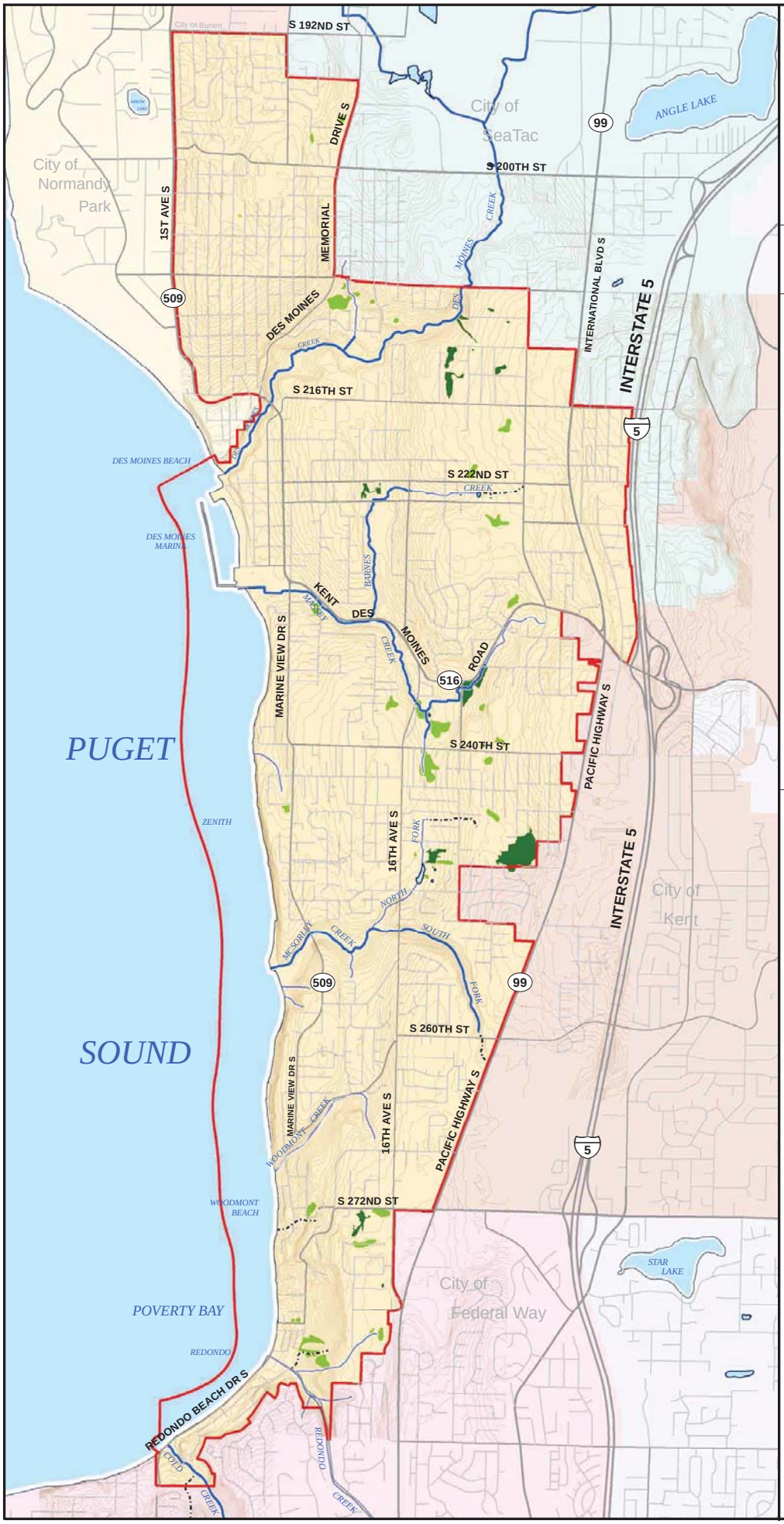

City of Des Moines
Washington

City of Des Moines

Critical Area Map Series

Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

10 ft Interval Contours

Des Moines City Limits

Streams

- F - Fish habitat
- N - Non-Fish habitat
- S - Shorelines
- U - Unknown
- X - Mapped feature - no water type

Wetlands Status

- Delineation
- Potential Wetland / Not Field Surveyed

Jurisdictions

- Normandy Park
- Burien
- SeaTac
- Kent
- Federal Way
- Unincorporated King County

N

500 0 500 1,000

Scale In Feet

Source: City of Des Moines GIS
April 2007

Figure 2-7
Wetlands and Surface Water

Des Moines Surface Water Comprehensive Plan

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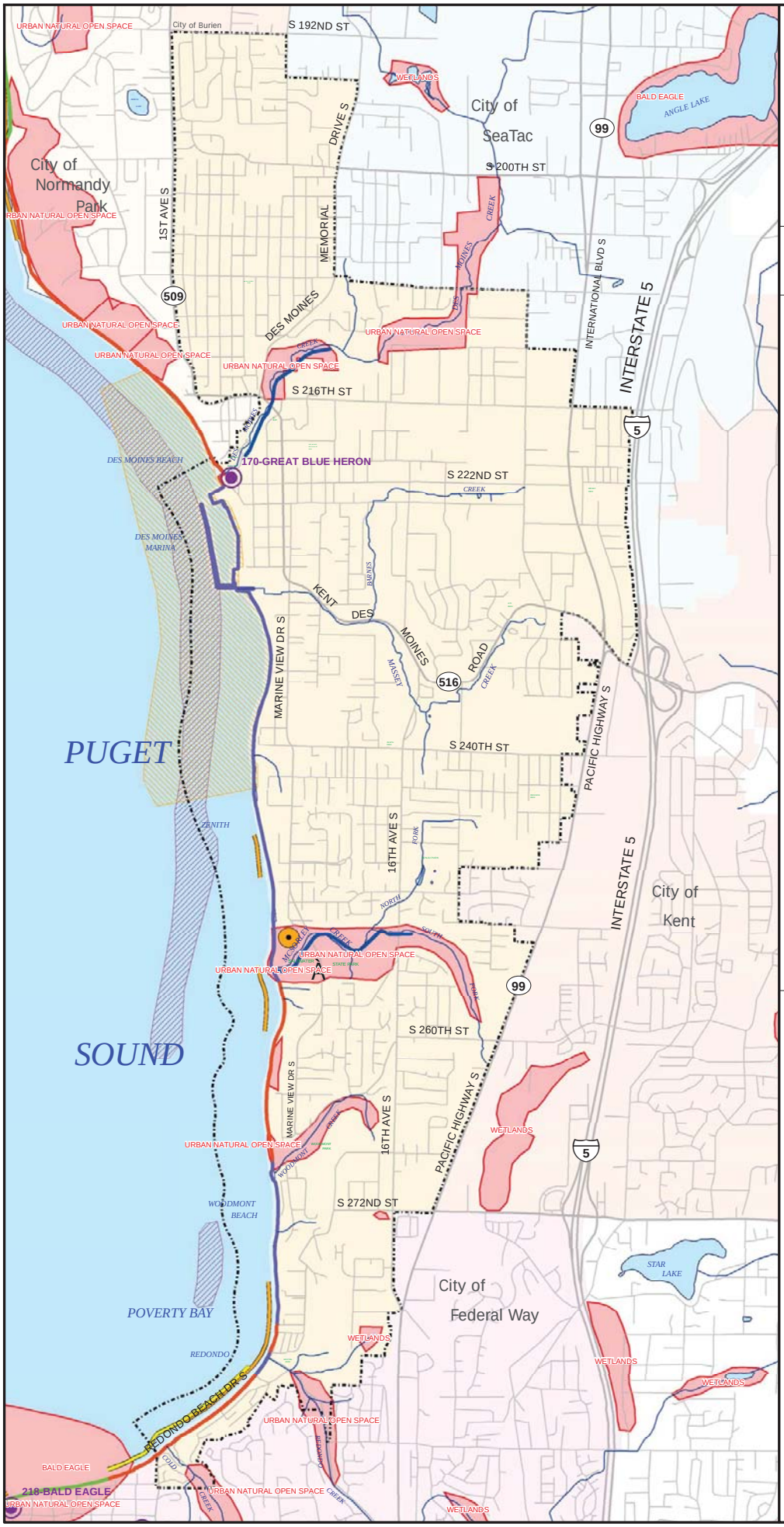

City of Des Moines
Washington

City of Des Moines

Critical Area Map Series

Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

Wildlife Heritage Pts (WDFW)

Seabird Colony (WDFW)

Eelgrass (WDNR)
- ABSENT
- CONTINUOUS
- PATCHY

Priority Habitats and Species Fish Presence
- PHS Fish Presence

Sand Lance (WDFW)

Surf Smelt (WDFW)

Hard Shell Clam (WDFW)

Geoduck (WDFW)

PHS Polygons

Des Moines City Limits

Streams

Jurisdictions
- Normandy Park
- Burien
- SeaTac
- Kent
- Federal Way
- Unincorporated King County

N

500 0 500 1,000
Scale In Feet

Source: City of Des Moines GIS
April 2007

Figure 2-8
Fish and Wildlife Conservation Areas

Des Moines Surface Water Comprehensive Plan

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Water Quality and Pollution Sources

Des Moines Creek is classified by Ecology as a Class AA (extraordinary) water. Class AA waters are intended to be usable for water supply, livestock watering, fish and wildlife, and recreation (CH2M HILL 2003). Over the years, water quality in Des Moines Creek has been adversely affected by jet fuel spills, commercial and industrial stormwater runoff, and poorly maintained septic systems. These have contributed to elevated concentrations of contaminants in Des Moines Creek (SeaTac 2013). Des Moines Creek has been identified on Ecology's 303(d) list for exceeding water quality standards for dissolved oxygen, fecal coliform bacteria, zinc, and copper. Ecology developed this version of the 303(d) list in 2010 (Ecology 2012a). In 2012, Ecology conducted a study and found that dissolved copper and zinc levels in Des Moines Creek were within water quality criteria levels throughout all 303(d)-listed sites, likely due to habitat improvements (Ecology 2012b).

Habitat

Historically, coho salmon, chum salmon, and steelhead trout had access to Des Moines Creek. Today, there are typically only resident cutthroat trout throughout the waterways. Access above Marine View Drive is severely limited, leading to degraded water quality and impaired fish habitat (King County 2007).

2.2.2 Massey Creek Basin

2.2.2.1 Natural Waterbodies

Massey Creek

The Massey Creek Basin is the largest drainage basin in the city of Des Moines, covering approximately 1,700 acres (Des Moines 2001). It is located on the western portion of the ridge separating Puget Sound from the Green River valley. Massey Creek drains approximately 2 square miles of bluff between the Green River Basin and Puget Sound. There are approximately 9 acres of wetlands with approximately 4 acres contained within riparian corridors. The basin contains 11,000 feet of riparian corridor (Des Moines 1994).

Barnes Creek

Barnes Creek is a major tributary to Massey Creek. It covers approximately 5.7 acres and includes a valley bottom and the two adjacent slopes. A relatively steep hill slopes towards the valley bottom from the west. A gentler hill slopes toward the valley bottom from the east (Des Moines 2008).

2.2.2.2 Land Uses

The three dominant land uses in the basin are single-family residential, high-density multi-family residential, and commercial. Commercial areas are predominant in the upper basin, straddling Pacific Highway South, and in the downtown area of Des Moines along Marine View Drive. Apartments are prevalent along Kent-Des Moines Road and in the upper basin along Pacific Highway South. Single-family homes dominate the remaining area (Des Moines 1994).

2.2.2.3 Known Issues

Drainage and Flooding

Significant flooding has historically occurred along lower Massey Creek, resulting from development upstream of, and within, the floodplain. Inadequate capacity for storm flows and stream erosion have also been problems along lower Massey Creek (Des Moines 1994).

Water Quality and Pollution Sources

Similar to Des Moines Creek, Massey Creek has been identified on Ecology's 303(d) list (Ecology 2012a) for exceeding water quality standards for dissolved oxygen, fecal coliform, zinc, and copper.

Habitat

Massey Creek, from the mouth to 16th Place South, provides the most valuable anadromous fish habitat in the drainage basin. Approximately 1,000 feet downstream of 16th Place South is a key fish-spawning habitat area (approximately 1,500 feet long). The stream reach from 16th Place South to 3,000 feet upstream provides a good habitat for resident trout. Typically, an abundance of trout indicates low use by anadromous salmonids. This condition is often found upstream of a barrier to migration, or situations where anadromous fish are scarce (Des Moines 1994). Amphibious species in this basin include northwestern and long-toed salamander and Pacific tree frog (Des Moines 1994).

Barnes Creek, from the outfall into Massey Creek to 3,000 feet upstream, is a key habitat area due to the undisturbed nature of this reach. The water quality is good, but salmon production is limited by low stream flows. The population of small resident cutthroat trout is relatively large for this size of creek (Des Moines 1994). A 2-acre wetland area exists within the Barnes Creek area, with emergent, scrub-shrub, and forested wetland communities that have developed in response to historical disturbance (past agricultural use, then abandoned) (Des Moines 2008).

2.2.3 McSorley Creek Basin

2.2.3.1 Natural Waterbodies

The North Fork of McSorley Creek (formerly Smith Creek) drains an area largely within the southeast corner of Des Moines, along with a portion of the State Route (SR) 99 corridor and the Saltair Hills area within the city of Kent (Des Moines 1987). Limited study information is available for the South Fork of McSorley Creek.

Land Uses

The North Fork of the McSorley Creek drainage basin is approximately 300 acres and located within Saltwater State Park (CH2M HILL 2003). Within this area, approximately 15 acres are zoned medium-density residential, 31 acres comprise the commercial areas along Highway 99, and the remaining 254 acres are zoned single-family residential (Des Moines 1987).

2.2.3.2 Known Issues

Drainage and Flooding

The existing drainage basin experiences localized flooding, ponding, and channel overflows that run across private yards. This flooding is the result of uncontrolled runoff from developed areas and inadequate capacity in existing storm drainage systems. Existing flooding problems occur along the main stem of McSorley Creek and in localized areas within the drainage basin during moderate to severe rainfall events (Des Moines 1987).

Water Quality and Pollution Sources

Because the North Fork of McSorley Creek receives stormwater runoff from the Midway Landfill, several water quality studies have been conducted to monitor potential impacts. During base flow conditions, water quality was generally good; however, the following conditions have been observed, particularly during storm flows (Des Moines 2001):

- High temperatures during base flow, and low dissolved oxygen concentrations during storm and base flow
- High turbidity during storm flow
- High ammonia nitrogen concentrations during storm flow
- High total metals concentrations during storm flow
- High fecal coliform bacteria concentrations during storm and base flow

Similar to Des Moines Creek and Massey Creek, the North Fork of McSorley Creek has been identified on Ecology's 303(d) list for exceeding water quality standards for dissolved oxygen, fecal coliform, and copper (Ecology 2012a).

Habitat

King County conducted a habitat survey of Massey Creek in 1987. Similar to Des Moines Creek and Massey Creek, McSorley Creek exhibited widely varying habitat quality along several reaches. Channelization, loss of channel diversity, and sedimentation were typical problems associated with the varying habitat quality. However, much of the stream still provided good fish habitat, and many areas were suitable for restoration (Des Moines 2001).

2.2.4 Additional Basins

2.2.4.1 Normandy Creek

The northwest portion of the city of Des Moines lies in the upstream portion of the Normandy Creek Basin, although no part of the stream itself flows through the city. The Normandy Creek Basin is approximately 800 acres with approximately 30 percent of that area within the city of Des Moines. The predominant land use in the basin is single-family residential. Canopy cover is good throughout most of Normandy Creek, with the exception of channelized portions within residential yards in the downstream reach. Fish passage barriers are present at the outfall to Puget Sound and 500 feet upstream of the outfall at a pond weir. Also, flooding occurs on the banks of Arrow Lake during high flows due to capacity limitations of 1,100 lineal feel of 24-inch pipe downstream of the outlet weir. Stream gradients are steep in the upstream reaches and extensive bank erosion and seepage is present just downstream of Marine View Drive. Above Marine View Drive, the stream flows through wetland habitat in Nature Trails Park. Historically, fish have not been observed in the stream and the current fish habitat is insignificant (Normandy Park 1992). Normandy Creek was not identified on Ecology's 303(d) list for any exceedances (Ecology 2012a).

2.2.4.2 Lower Puget Sound Basins

Woodmont Creek

Woodmont Creek originates in a forested ravine, and functions primarily as a stormwater conveyance channel with severe bank erosion. This creek flows directly into Puget Sound (CH2M HILL 2003). Woodmont Creek was not identified on Ecology's 303(d) list for any exceedances (Ecology 2012a).

Redondo Creek

Redondo Creek is one of the most severely incised channels in the basin, with heavy erosion associated with high flows and poor water quality resulting from

non-point pollution from residential and commercial sources. This creek flows directly into Puget Sound (CH2M HILL 2003). Redondo Creek has been identified on Ecology's 303(d) list for exceeding water quality standards for fecal coliform bacteria (Ecology 2012a). Habitat quality in this basin, measured by factors that include wetland presence and quality, stream geometry and condition, gradients, and presence of woody debris, is considered low (King County 1991).

Cold Creek

Cold Creek drains from Easter Lake and flows into Puget Sound. This creek has been piped and channeled in several locations (CH2M HILL 2003). Cold Creek was not identified on Ecology's 303(d) list for any exceedances (Ecology 2012a). Habitat quality in this basin, measured by factors similar to Redondo Creek, is also considered low (King County 1991).

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3 Current Surface Water Management Program

3.1 Overview

The major elements of SWM's current surface water management program consist of planning and engineering, inspections and maintenance, NPDES Permit compliance, administration, and capital project implementation. Table 3-1 summarizes the existing activities provided within each of these elements, and additional discussion is included below.

SWM oversees the implementation of the surface water management program with support from the City's Engineering Division, which is also part of the City's Planning, Building, and Public Works Department (Figure 3-1). Specific staff numbers, funded in association with each component of the surface water management program, are discussed in the following sections. Appendix D presents a summary matrix of the level of service provided in the current surface water management program.

3.2 Planning and Engineering

SWM's Planning and Engineering Group is responsible for the planning, project design, and long-range implementation of the surface water management program. The group's activities include:

- Design and management of capital projects
- Preparation of engineered work orders for maintenance crews
- Permitting plan review
- Response and resolution of public drainage complaints

Table 3-1. Overview of Current Surface Water Management Program

Program Element and Associated Costs									
Planning and Engineering	Inspections and Maintenance	NPDES							Administration	Capital Projects
Staff salaries, supplies, and specific labor required for stormwater engineering and planning (Stormwater Comprehensive Plan, NPDES SWMP Plan, etc.).	Routine system inspections and maintenance (includes NPDES-required work): field crew staff salaries, equipment, interfund transfers for repairs, etc.	Implementation of NPDES Permit program ● SWMP document updates included under Planning and Engineering ● NPDES inspections and maintenance included under Inspections and Maintenance general program component							Overhead costs of operating the program: support staff salaries, state taxes, utility taxes, and non-element-specific expenses.	Large-scale construction, expansion, renovation, or replacement projects; purchases of major, long-term use equipment; or major long-term maintenance, repair, or rehabilitation projects.
		Public Education	Public Involvement	Illicit Discharges	Control Runoff	Operation and Maintenance	Monitoring	Tracking and Reporting		
		Reduce or eliminate public stormwater impacts and encourage participation in stewardship.	Ongoing opportunities for involvement, such as advisory councils, public hearings, watershed committees, and rate-structure input.	Prevent, detect, characterize, trace, and eliminate illicit connections and discharges into the storm drain system.	Reduce pollutants in stormwater runoff from new development, redevelopment, and construction site activities through permitting, plan review, and inspections.	Perform operation and maintenance on the storm drain system and provide staff training.	Conduct local water quality monitoring or pay into a fund to support regional monitoring.	Gather information, track program success, set action priorities, retain records, and submit reports to Ecology.		

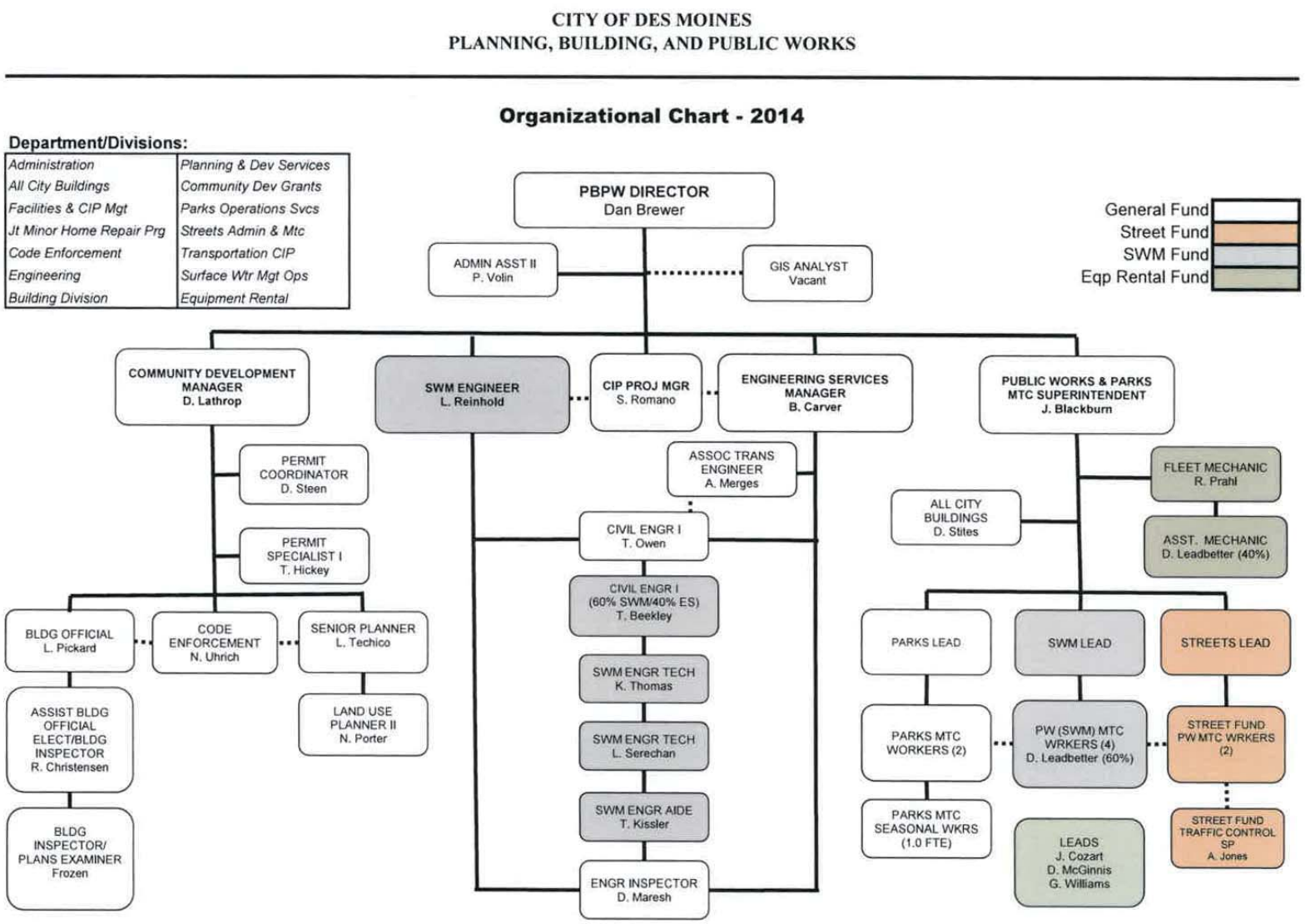

Figure 3-1
Planning, Building, and Public Works Department Organizational Chart

- Inspection of construction projects; review, revision, and adoption of local development-related codes, rules, and standards to incorporate low impact development (LID) principles and best management practices (BMPs)
- Funding for outside consultant services, such as development of the Surface Water Comprehensive Plan
- Miscellaneous consultant engineering services
- Drainage basin planning
- Des Moines Creek Basin Committee participation
- Voluntary Pipe Program management
- Preparation of applications and management of awards for grants related to non-NPDES work

The Planning and Engineering component funds a total of 2.5 full-time employees (FTEs) consisting of:

- 0.7 SWM Utility Manager
- 1.0 Engineering Technician
- 0.5 Engineering Aide
- 0.3 GIS Analyst

3.3 Inspections and Maintenance

SWM's Inspections and Maintenance Group is responsible for routine inspections and regular maintenance of the existing storm drain system and implements smaller pipe replacement and repair projects.

The group's activities include:

- Inspecting facilities annually as required under the NPDES Permit (i.e., detention facilities, treatment facilities, bioretention, vegetated roofs, and permeable pavements), and by the City's Code (i.e., pipes, swales, ditches, culverts, street gutters, and catch basins) (DMMC 11.20.080(5)(a)(ii)).
- Paper filing of records and tracking through a spreadsheet database.
- Purchasing and maintaining field gear and uniforms.
- Renting heavy equipment (stream dredging, catch basin placement, landslide response).
- Paying debris and liquid dump fees from cleaning of storm drain systems.
- Reserving a contingency fund for equipment repair.

- Contracting street sweeping services. Downtown streets are currently swept twice monthly. Residential streets are swept twice monthly in the winter and once monthly during the remainder of the year.
- Contracting outside services for drainage repair (large drainage projects beyond time, equipment, or experience limitations of work crew).
- Implementing the Voluntary Pipe Program, in which the City provides heavy equipment and labor to replace residential ditches if the property owner pays for materials (catch basins, backfill, etc.).

The Inspections and Maintenance component funds a total of 5.9 FTEs consisting of:

- 0.3 Public Works and Parks Maintenance Superintendent
- 1.0 Senior Maintenance Worker (assigned to the Park Operations group)
- 4.0 Maintenance Workers
- 0.6 Assistant City Mechanic

3.4 NPDES Permit Program

SWM is the lead division responsible for compliance with the NPDES Permit described in Section 1.2.1. General activities funded through the NPDES Permit component of SWM's surface water management program include:

- Preparing applications and managing awards for NPDES-related grants
- Contracting and managing outside professional services, as needed
- Administering NPDES training expenses, including travel
- Collecting NPDES Permit fee

The NPDES Permit Program component funds a total of 2.3 FTEs consisting of:

- 0.2 SWM Utility Manager
- 0.6 Water Quality Specialist or Civil Engineer
- 0.5 Engineering Aide
- 1.0 Engineering Technician

Specific elements within the NPDES Permit Program component are described in the following sections.

3.4.1 Public Education and Outreach

The City's Public Education and Outreach Program is intended to educate the public, engineers, contractors, developers, and land use planners doing business in Des Moines about stormwater problems, and identify specific actions they can follow to minimize such problems.

The components of SWM's Public Education and Outreach Program consist of:

- Website
- Brochures
- Quarterly City newsletter
- Participation in the "Puget Sound Starts Here" campaign, which is a partnership of cities, counties, state and federal agencies, non-profit groups, and local organizations working to improve water quality and aquatic habitat in the Puget Sound region (Puget Sound Partnership 2014)
- Televised City Council meetings
- Storm drain marker program
- Car wash kits for public fund raisers that encourage proper containment and capture of wash water

3.4.2 Public Involvement and Participation

The goal of SWM's Public Involvement and Participation Program is to create opportunities for the public to participate in decision-making processes involving development, implementation, and update of the surface water management program.

The components of SWM's Public Involvement and Participation Program consist of:

- Providing the Stormwater Management Program Plan and NPDES Annual Report to the public on the City's Website; all other NPDES Permit submittals available upon request
- Collecting and tracking Website comments
- Collaborating with Friends of Des Moines Creek
- Collaborating on WRIA 9 (Duwamish-Green River Water Resource Inventory Area) salmon habitat recovery
- Conducting public meetings regarding surface water-related issues

3.4.3 Illicit Discharge, Detection and Elimination

The City's Illicit Discharge, Detection and Elimination (IDDE) Program is intended to prevent, detect, characterize, trace, and eliminate illicit connections and discharges into the storm drain system. The IDDE Program is required to maintain a complete map of the storm drain system; implement regulations to effectively prohibit non-stormwater, illicit discharges; detect and identify non-stormwater discharges and illicit connections; address illicit discharges,

including spills and illicit connections; train staff in IDDE techniques; and track and maintain IDDE records.

The components of SWM's IDDE Program consist of:

- Developing and updating a comprehensive GIS map of the City's storm drain system
- Identifying high-priority issues
- Conducting staff training
- Ensuring follow-up of public reports and conducting field screening of potential illicit connections (In 2012, 18 public reports were received, all of the reports were inspected, and 9 illicit connections were identified [Des Moines 2013a].)

3.4.4 New Development, Redevelopment, and Construction Site Runoff Control

The goal of the City's New Development, Redevelopment, and Construction Site Runoff Control Program is to reduce pollutants in stormwater runoff from new development, redevelopment, and construction site activities. As part of the program, SWM is required to implement regulations that incorporate and prioritize LID standards for new development, redevelopment, and construction site projects; include a permitting process with site plan review, inspection, and enforcement; verify adequate long-term operation and maintenance of stormwater treatment and flow control facilities for these projects; and train staff responsible for implementing the program.

The components of SWM's New Development, Redevelopment, and Construction Site Runoff Control Program consist of:

- New development design review in accordance with local codes pertaining to pollution prevention (budget reflected in Planning and Engineering).
- Inspection of new development stormwater facilities. In 2012, all 63 public facilities and 67 private facilities were inspected.
- As allowed by the NPDES Permit, some facilities were identified for reduced inspection frequency in 2010.

3.4.5 Pollution Prevention and Operation and Maintenance

The NPDES Permit requires SWM to perform operation and maintenance on the storm drain system and provide staff training. SWM must conduct annual inspections of all municipally owned or operated permanent stormwater treatment and flow control facilities as defined by the NPDES Permit (i.e., bioretention, detention facilities, infiltration facilities, constructed wetlands, oil and water separators, sediment basins, porous pavement, vegetated roofs, and permeable pavements); inspect catch basins and inlets every 2 years; perform spot checks of potentially damaged permanent stormwater treatment and flow control facilities after major storm events; and take appropriate maintenance actions in accordance with adopted standards. In addition, SWM must train staff responsible for implementing the program; develop and implement a Stormwater Pollution Prevention Plan for all heavy equipment maintenance or storage yards; and maintain records of inspections and maintenance or repair.

The components of SWM's Pollution Prevention and Operation and Maintenance Program consist of:

- Development and implementation of the City Fleets and Facilities Stormwater Pollution Prevention Plan (Des Moines 2010a)
- Annual inspections of existing stormwater management facilities and upgrading to efficient maintenance standards, as needed

3.4.6 Monitoring

Under provisions of the NPDES Permit, the City is required to:

- Conduct status and trends monitoring of stream and marine water quality, benthos, habitat, and sediment chemistry, or pay into a collective fund to implement the Regional Stormwater Monitoring Program (RSMP) for status and trends monitoring of small streams and nearshore areas in Puget Sound
- Conduct stormwater discharge monitoring, or pay into a collective fund to implement RSMP effectiveness studies
- Pay into a collective fund to support source identification and diagnostic monitoring through the RSMP Source Identification Information Repository

The City has elected to pay into the RSMP for all of the above requirements and provides the following annual contributions:

- $7,152 – Status and Trends Monitoring
- $11,916 – Effectiveness Studies (stormwater monitoring)
- $1,105 – Source Identification

3.4.7 Tracking, Recordkeeping, and Reporting

The NPDES Permit requires the City to gather information, track the implementation of the surface water management program, and set priorities for permit compliance. In addition, the City is required to generate certain reports to be submitted to Ecology and retain records documenting compliance with the NPDES Permit requirements. The required submittals to Ecology include an annual report with supporting documents, and the SWMP Plan. The purpose of the SWMP Plan is to inform the public of the planned SWMP activities for the upcoming calendar year. The Plan is updated annually.

Activities that the City includes in its Tracking, Recordkeeping, and Reporting Program are:

- Receiving and following-up of public complaints through a Web-based comment form and telephone hotline
- Tracking of data via a spreadsheet log of activities
- Ensuring a budget tracking system is in place
- Generating the annual NPDES report and updating the SWMP Plan, when necessary

3.5 Administration

The SWM budget also includes funding for routine operations of the department. These costs include:

- King County billing services and tax collection services (SWM's surface water management program is funded by a property tax that is administered by King County. King County acts as a collection agency on behalf of the City and redistributes the stormwater fees back to SWM on a monthly basis.)
- WRIA 9 (Duwamish-Green River Water Resource Inventory Area) salmon habitat recovery collaboration fees
- Employee benefits
- Office supplies
- Janitorial services
- Advertising (job announcements and public notices of pending actions)
- Training-related travel expenses
- Taxes
- Professional dues and conferences
- Interfund services (computer maintenance, facility insurance, and administrative repairs)
- Postage, telephone, Internet, and utilities for Public Works Building

The Administration component of SWM's surface water management program funds a total of 0.3 FTEs consisting of:

- 0.15 Public Planning, Building, and Public Works Director
- 0.15 Administrative Assistant

3.6 Capital Project Implementation

The City performs capital construction of stormwater-related projects, funded by rates and fund balance. The Capital Projects List for 2014–2019 has nine projects that use a percentage of SWM's overall rate revenue.

3.7 Budgeting

The current surface water management program is primarily funded through a surface water property tax rate, with some additional funding provided by grants and Interlocal agreements. SWM periodically evaluates the surface water rate to determine if the base amount is adequate to meet program needs and if the portions of the rates allocated between commercial and residential customers is appropriate. SWM evaluated the efficiency and general rate structure of the surface water management program in 2004 (FCS 2004), followed by a detailed assessment of the surface water rate and levels of service in 2006 (FCS 2006). Most recently, SWM conducted a detailed evaluation of the division of the surface water rate between residential and commercial customers (FCS 2013) and made adjustments in the rates charged the following year. An additional financial analysis has been conducted as part of this SWCP, which is discussed in Appendix E.

SWM generates an annual budget outlining how the surface water rate revenue will be allocated to its costs and needs for the coming year. A copy of the 2014 SWM Budget is presented in Appendix F.

3.8 Identified Gaps in Current Program

In general, SWM’s current surface water management program complies with most regulatory requirements and provides an adequate level of service to the surface water rate customers. However, the following gaps swere identified in the existing program:

- **NPDES Operation and Maintenance**: Stormwater management facilities must be inspected at least once per year. The City crews inspected each existing facility annually and bring them up to full performance as needed. However, since 2012, at least four major facilities have been constructed or soon will be. SWM is in the process of updating operation and maintenance procedures to include these facilities and have maintenance crews provide these inspection duties. As additional facilities are constructed, the ability of existing maintenance staff to continue to meet the permit inspection and maintenance requirements may be affected.

- **NPDES Tracking, Recordkeeping, and Reporting**: The existing inspection and maintenance records contain a large backlog of paper activity reports that have not been entered into the electronic database.
- **Capital Project Implementation**: The City currently does not have an emergency fund within the capital projects budget or a systematic program for replacement of failing infrastructure.

Recommended approaches to address these gaps are discussed in Chapter 4.

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4 Program Recommendations

4.1 Purpose

SWM's current surface water management program provides an appropriate level of service and is in compliance with its NPDES Permit. Gaps in the desired level of service and evolving priorities have been identified in Section 3.8 above. The purpose of this chapter is to present recommended approaches for addressing identified gaps, provide additional recommendations to increase program efficiencies and costs, adjust priorities, and offer a cohesive framework for all future program upgrades centered on key focus areas.

4.2 Key Focus Area Recommendations

SWM's mission statement, presented in Section 1.1, focuses on issues such as flooding, erosion, sedimentation, water quality degradation, stream and wetland protection, future growth, public safety, and property protection. All of these elements are part of three main focus areas around which the surface water management program is centered: drainage, water quality, and habitat. Future program upgrades centered on these focus areas will provide continuity of efforts while aligning with local and state requirements, regional initiatives, City goals and priorities, and public needs. Each of the focus areas is discussed below.

4.2.1 Drainage

Activities pertaining to drainage management address the safety and convenience of those living or working within an area subject to stormwater runoff. In general, drainage management consists of a functional storm drain system, sometimes equipped with flow control facilities, that safely and efficiently conveys stormwater runoff to receiving waters. Drainage management controls and minimizes flooding and erosion, accommodates future urban growth, corrects existing surface water problems, addresses public safety, and prevents property damage.

The City's existing storm drain system and flow control facilities are generally adequate to address drainage needs to the level of service in place when the systems were constructed. However, the infrastructure within the storm drain system includes extended lengths of pipe that are near the end of their useful life and SWM does not currently have a dedicated plan or funding mechanism to pay for the repair and replacement of these aged components. It is recommended that the City establish a repair and replacement fund to handle these anticipated, but unpredictable, repairs of pipe failure.

4.2.2 Water Quality

Activities pertaining to water quality management both prevent pollutants from mixing with stormwater runoff and reduce or remove pollutants already entrained in runoff. In general, a functional water quality program includes public education; activities and practices that control sources of pollutants; constructed facilities that reduce or remove pollutants from stormwater runoff; and monitoring plans to assess the effectiveness of the program. The management of water quality controls and minimizes sedimentation in local streams and wetlands, and controls and minimizes water quality degradation in surface waters from lack of dissolved oxygen, high temperatures, and discharges of oil and grease, metals, industrial toxins, and other pollutants harmful to aquatic life. In the long term, the goal of an effective water quality program is to not only protect the current water quality, but improve the water quality in future years.

Based on recent regulatory developments, it is anticipated that future versions of the Municipal NPDES Permit will require the City to implement a stormwater quality retrofit plan. It is recommended that the City begin preparing for the future potential need by compiling and organizing information related to stormwater quality and flow retrofitting, including:

- Updating the mapping and inventory of surface water features, including streams and wetlands
- Updating maps of the City's stormwater management infrastructure and treatment facilities (including minimization of impacts through retained vegetation, and other beneficial water quality features such as roadside ditches), along with indicating key attributes of each facility, such as structure inverts, size, property limits, and ownership, etc.
- Identifying and tracking existing water quality problems and existing pollution sources
- Collect flow monitoring data in local streams
- Establishing policies and opportunity funding for add-on retrofits to other capital projects
- Preparing a retrofit plan to identify potential improvement opportunities in preparation of obtaining available grant funding

Water quality retrofit projects tend to involve long planning periods. By initiating information gathering at an early stage, the City can evaluate options early on and make use of funding and construction opportunities as they arise. In addition, even if specific requirements for water quality retrofit are not imposed on the City, all groups within the surface water management program will benefit from access to the information gathered.

4.2.3 Stream and Receiving Water Habitat

Habitat management programs typically focus on the protection of existing fish and wildlife habitat, and work to create new habitat where possible. Drainage and stormwater quality are directly linked to habitat protection. Habitat management helps to protect the stream ways and wetlands within the city limits. Creation of new habitat can help to mitigate the negative impacts of new development projects. Similar to water quality data, the City does not have a central clearinghouse of information for City habitat areas and improvement opportunities. Therefore, it is recommended that the City begin compiling and organizing habitat-specific information as part of the data gathering effort discussed in the previous section.

4.3 Program Component Recommendations

Recommended approaches for addressing gaps in the current surface water management program identified in Section 3.8 are presented below. Recommendations to increase program efficiencies and reduce costs are also provided.

4.3.1 Planning and Engineering

Activities to Address Gaps in Current Program:

- No gaps identified.

Additional Recommendations:

- Develop a programmatic evaluation for compliance with the State Environmental Policy Act for surface water capital projects
- Prepare a project management manual or provide project management training for staff to effectively manage additional surface water capital projects
- Add (or reallocate) 1.0 engineering FTE to support additional capital project management and delivery (project management, construction management, procurement, etc.)
- Establish a drainage permit fee to help fund engineering review and inspection by the City.

4.3.2 Inspections and Maintenance

Activities to Address Gaps in Current Program:

- Add 0.33 FTE to maintenance staff to meet obligation of required annual inspections for the expanding drainage system (1.0 FTE shared between Maintenance and Inspection and NPDES compliance groups).

Additional Recommendations:

- To better assess the stormwater infrastructure and identify where a pipe is either failing or at risk of failure, SWM should establish a program to inspect and document the City's entire enclosed storm drain system using closed-circuit television (CCTV) equipment. The City plans to purchase the CCTV equipment and have staff crews conduct the assessments. It is recommended that the City maintenance staff assess 15 percent of the storm drain system annually until complete.

4.3.3 NPDES Permit Program

Activities to Address Gaps in Current Program:

- Operation and Maintenance: Add 0.33 FTE to increase inspection coverage (1.0 FTE shared between Maintenance and Inspection and NPDES compliance groups) of the expanding drainage system
- Tracking and Reporting: Add 0.33 FTE to input existing backlog of inspections and maintenance records and for ongoing records maintenance (1.0 FTE shared between Maintenance and Inspection and NPDES compliance groups)

Additional Recommendations:

- Tracking and Reporting: Update tracking database from paper inspection forms and spreadsheet log to software tracking system that includes direct field data entry through an electronic interface
- Water Quality and Habitat: Track information collected as part of permit compliance to support the water quality and habitat information clearing houses discussed in Section 4.2

4.3.4 Administration

In general, administrative activities, budget, and staffing should be increased proportionate to other program components to maintain an adequate level of support.

4.3.5 Capital Project Implementation

Activities to Address Gaps in Current Program:

- As discussed in Section 4.2.1, the City does not have a current systematic plan for repair and replacement of aging capital assets (storm

drain system, flow control facilities, and water quality treatment facilities). It is recommended that an emergency repair and replacement service account be established to address the increased risk of unanticipated system failures and the funding of high priority capital projects to proactively replace aging capital assets. Budgeting options for this account are discussed in Section 4.4.2.

Additional Recommendations:

- To provide a consistent approach to capital project planning and prioritization, it is recommended that the project scoring system outlined in Appendix B be applied to future potential capital projects.

4.4 Implementation

4.4.1 Project Identification

Capital project locations are shown on Figure 4-1 and in Appendix C. These projects were identified by City staff and the public in meetings and workshops held during the course of the SWCP planning effort. These projects will be initiated using the prioritization process described in Appendix B. Over the life of the SWCP, additional projects will be identified in this same process of discovery that includes public reporting and staff inspections. In addition, the SWCP recommends additional study and activities that may lead to new capital projects, including the Corrugated Metal Pipe (CMP) Replacement Program[1] and a water quality retrofitting evaluation. It is recommended, as described in Section 1.5, that a periodic review be conducted of the prioritized projects. After year five of the program, new projects and uncompleted existing projects should be re-prioritized to generate and update the capital projects list.

4.4.2 Financial Planning and Staffing

Potential costs of the recommended program components and capital projects have been evaluated in four different funding scenarios, as described below. Each scenario would address a baseline level of service compliant with all regulatory requirements. In addition, each scenarios includes establishing a Drainage Permit Fee, a Street Fund charge for waste disposal, and the transition of engineering staff to support CIP delivery. Scenarios 3 and 4 are combined with different levels of operational efficiencies and completion of capital projects. A listing of the High, Medium, and Low Priority capital projects included in the scenarios is presented in Appendix B. Details of the financial analysis of each of the scenarios is presented in Appendix E.

[1] The CMP Replacement Program is synonymous with the Pipe Replacement Program element of the CIP, referred to in Appendix B. However, to differentiate it from the City's Voluntary Pipe Program, the term "CMP Replacement Program" is used throughout the main text of the SWCP.

Scenario 1:

- Operations: Addition of 1.0 FTE to the maintenance staff in 2015 for support of NPDES and operational inspections and input of maintenance record backlogs. No additional engineering staff.
- Capital Program: Fund up to 13 of the 19 of the High Priority projects. Of the 13 funded projects, Capital Project 9 would be delayed until 2018, and 6 other projects would be delayed until approximately 2023, depending on the cost savings made through reduction in the City's Voluntary Pipe Program. Based on 2013 expenditures, the City estimates the annual costs of the Voluntary Pipe Program to be approximately $110,000 per year for installation of approximately 1,000 lineal feet (0.2 mile) of pipe and associated structures, such as catch basins. Based on City GIS data, the existing drainage system has a little over 90 miles of total pipe, including approximately 14 miles of CMP. This scenario would replace between 20 and 25 percent (2.8 to 3.5 miles) of the CMP through capital improvements.
- Utility Fee Increase: No increase beyond an assumed inflation rate of 2.30 percent annually through 2024.

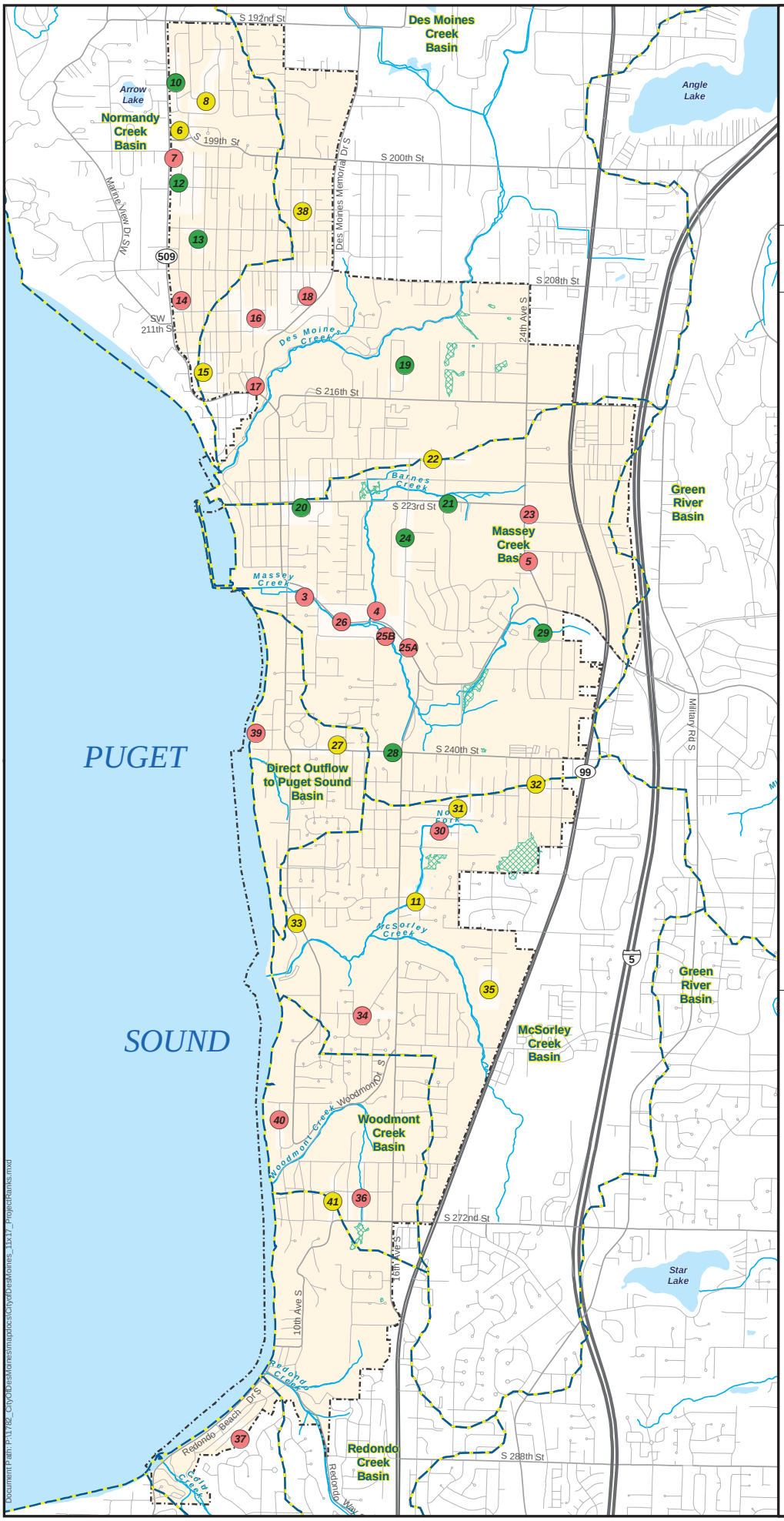
Scenario 2:

- Operations: Addition of 1.0 FTE to the maintenance staff in 2015 for support of NPDES and operational inspections and input of maintenance record backlogs. No additional engineering staff.

  Capital Program: Fund approximately 14 out of 19 of the High Priority projects. This scenario would replace approximately 33 percent (4.6 miles) of the CMP. The City's Voluntary Pipe Program would be maintained.
- Utility Fee Increase: An annual 4.00 percent increase beginning in 2016, tapering back down to a standard increase based on inflation by 2019.

Scenario 3 (RECOMMENDED):

- Operations: Addition of 1.0 FTE to the maintenance staff in 2015 for support of NPDES and operational inspections and input of maintenance record backlogs. Addition of 1.0 FTE to the engineering staff concurrent with increased capital project management and delivery needs (estimated in 2021)
- Capital Program: Fund all High Priority projects by 2025. This scenario would replace approximately 40 percent (5.6 miles) of the CMP. The City's Voluntary Pipe Program would be maintained.
- Utility Fee Increase: An annual 6.00 percent increase beginning in 2016, tapering back down to a standard increase based on inflation by 2022.



City of Des Moines

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Capital Project and Rank
- High
- Medium
- Low

Project Area

Stream

Drainage Basin

Wetland

Des Moines City Limits

N

500 0 500 1,000
Scale in Feet

Source: City of Des Moines, King County

Figure 4-1
Capital Project Locations

Des Moines Surface Water Comprehensive Plan

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Scenario 4:

- Operations: Addition of 1.0 FTE to the maintenance staff in 2015 for support of NPDES and operational inspections and input of maintenance record backlogs, and 1.0 FTE to the engineering staff in 2015 to support CIP implementation.
- Capital Program: Fund all High Priority and Medium Priority projects by 2025. This scenario would replace approximately 47 percent (6.6 miles) of the CMP. The City's Voluntary Pipe Program would be maintained.
- Utility Fee Increase: An annual 11.00 percent increase beginning in 2016, tapering back down to a standard increase based on inflation by 2022.

Implementation of Scenario 3 is recommended. This scenario would provide the additional necessary maintenance staff to comply with regulatory inspection and maintenance requirements for the expanding drainage system. This scenario would maintain public involvement through the popular and successful Voluntary Pipe Program. In addition, Scenario 3 would enable the City to complete all 19 High Priority capital projects over the next 10 years and would improve system reliability and safety by replacing approximately 40 percent of the City's aging CMP. Scenario 3 would also allow for the hiring of additional engineering staff concurrent with increased capital project management and delivery needs (estimated in 2021).

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5 References

CH2M HILL. 2003. SR 509: Corridor Completion/I-5/ South Access Road EIS Final Environmental Impact Statement. January 2003.

Des Moines, City of. 1987. North Fork of Smith Creek Drainage Basin Study, Final Draft. Prepared by R.W. Beck and Associates for the City of Des Moines. June 1987.

Des Moines, City of. 1990. Massey Creek Comprehensive Flood Control Management Plan. Prepared by R.W. Beck and Associates for the City of Des Moines Department of Public Works. June 1990.

Des Moines, City of. 1994. Lower Massey Creek Alternative Analysis. Prepared by KCM, Inc., for the City of Des Moines. August 1994.

Des Moines, City of. 2001. Five-Year Project Report: City of Des Moines Water Quality Monitoring Program. Prepared by Herrera Environmental Consultants for the City of Des Moines Surface Water Management Utility. February 2001.

Des Moines, City of. 2008. Barnes Creek Stormwater Detention Basin Wetland Delineation Report. Prepared by TetraTech, Inc., for the City of Des Moines, Public Works Department. May 2008.

Des Moines, City of. 2009. Integrated Pest and Vegetation Management Plan. December 2009.

Des Moines, City of. 2010a. City Fleets and Facilities Stormwater Pollution Prevention Plan (SWPPP). January 2010.

Des Moines, City of. 2010b. Shoreline Master Program. Prepared by the City of Des Moines Department of Planning, Building, and Public Works. Approved by the Department of Ecology November 1, 2010. Adopted by City of Des Moines Ordinance Number 1502 January 27, 2011.

Des Moines, City of. 2012. City of Des Moines Comprehensive Plan. Prepared by the City of Des Moines Planning, Building, and Public Works Department. Adopted by Ordinance Number 1469 on November 12, 2009. Amended by Ordinance Number 1551 on October 25, 2012.

Des Moines, City of. 2013a. NPDES Annual Report for the City of Des Moines, 2012 Reporting Year. Permittee Coverage Number WAR04-5511. Certified by the City of Des Moines on March 28, 2013.

Des Moines, City of. 2013b. 2014-2019 Capital Improvement Plan. Resolution Number 1244. Adopted by the City Council on November 14, 2013.

Des Moines, City of. 2013c. 2014 Budget. Ordinance Number 1589. Adopted by the City Council December 5, 2013.

Des Moines, City of. 2014. Stormwater Management Program Plan. May 2014.

Des Moines Creek Basin Committee. 1997. Des Moines Creek Basin Plan. Prepared in cooperation with the City of SeaTac, City of Des Moines, Port of Seattle, and King County. November 1997.

Ecology (Washington State Department of Ecology). 2012a. Current EPA Approved Water Quality Assessment. Approved by EPA December 2012. http://www.ecy.wa.gov/programs/wq/303d/currentassessmt.html

Ecology (Washington State Department of Ecology). 2012b. Copper and Zinc Levels in Des Moines, Massey, and McSorley Creeks, King County. Publication Number 12-03-041. Washington State Department of Ecology Environmental Assessment Program. Olympia, Washington. July 2012.

Ecology (Washington State Department of Ecology). 2013. Western Washington Phase II Municipal Stormwater Permit—National Pollutant Discharge Elimination System and State Waste Discharge General Permit for Discharges from Small Municipal Separate Storm Sewers in Western Washington. Issued August 1, 2012; effective August 1, 2013; expires July 31, 2018.

Ecology (Washington State Department of Ecology). 2014. Municipal Stormwater Permits Frequently Asked Questions. Water Quality Program. Revised July 2014.

FCS (Financial Consulting Solutions Group, Inc.) 2004. City of Des Moines Surface Water Utility Performance Review. July 2004.

FCS (Financial Consulting Solutions Group, Inc.). 2006. Surface Water Rate Study. Letter from John Ghilarducci, FCS Group, to Loren Reinhold, P.E., City of Des Moines. April 30, 2006.

FCS (Financial Consulting Solutions Group, Inc.). 2013. City of Des Moines Stormwater Utility Final Report for Stormwater Rate Structure Study. July 2013.

King County. 1991. Executive Proposed Basin Plan, Hylebos Creek and Lower Puget Sound. King County Department of Public Works Surface Water Management Division.

King County. 2007. Des Moines Creek—A Holistic Approach to Watershed Restoration. King County Department of Natural Resources & Parks. December 2007.

Normandy Park, City of. 1992. Surface Water Management Plan. Prepared by R.W. Beck and Associates for the City of Normandy Park. November 1992.

Puget Sound Partnership. 2014. Puget Sound Starts Here website. http://www.pugetsoundstartshere.org/about-us/. 2014.

SeaTac, City of. 2013. Surface Water Plan. Prepared for the City of SeaTac by Herrera Environmental Consultants, Inc. July 2013.

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Appendix A

City and Public Involvement Documents

CITY OF DES MOINES SURFACE WATER COMPREHENSIVE PLAN

Questionnaire 1 – Data Gathering and Background Information

PURPOSE

The purpose of this questionnaire is to kick off and promote staff involvement in the development of the surface water comprehensive plan. Input from City staff is pertinent to ensure that our consultant, Parametrix, has the information necessary to create an action list of capital improvement projects that will be designed and constructed in the future. To make this comprehensive plan a success, Parametrix would like for City staff to participate in a data gathering exercise and questionnaire. We know your schedules are full and we appreciate your time. We promise and encourage you to participate in this process so that we can prepare a comprehensive plan that we will be able to pride ourselves in creating and that our efforts will be to create a useful tool for years to come.

QUESTIONNAIRE

Please answer the following questions to the best of your ability:

- If you had to list one (1) single objective of the surface water comprehensive plan development process, what would it be?

- Our team needs to collect as much background data as we can in a very short time frame to develop a comprehensive understanding of the City's existing storm sewer system, maintenance policies, guidelines, goals, and objectives. Can you identify existing documents, policies or practices that may be relevant to our understanding of your collective surface water system?

- Are you aware of any persistent/existing surface water or storm sewer problems where repairs have been made but additional work should be done to fix the problem? If so, is there documentation of those problems at the City (e.g. record drawings, notes, calculations, reports, studies, etc.)?

- We have listed below the types of data and records we believe we need to collect in order to develop a comprehensive understanding of the City's current surface water system. Are there additional documents, studies, or modeling files that Parametrix did not request that you feel will benefit the comprehensive plan? If so, please list.

NEXT STEPS

Following this effort we will send out a second questionnaire related to specific surface water problems. Prior to that we will try to gather as much background data as possible and then along with your responses to this questionnaire we will facilitate a stakeholder meeting at the City. The goal of that meeting will be to develop a list of known problems within the City so that we can investigate and develop solutions that will be the basis of a construction/capital improvement plan.

DATA GATHERING

Our goal is to gather as much of the following information as possible:

- 1991 Surface Water Plan.
- Previous Surface Water Rate Studies.
- Available staffing analysis.
- 2013 Annual Reports and Stormwater Management Program (SWMP) documents.
- City Illicit Discharge Detection and Elimination (IDDE) and Erosion and Sedimentation Control Inspection policies.
- City codes and ordinances pertaining to stormwater.
- City comments on the draft Phase II Permit.
- Capital Improvement Program 2011-12 – 2015-16, plus any additional project lists or records of stormwater problem areas.
- Basin Plans, delineations and related studies.
- Geographic information system (GIS) data including existing stormwater system, soils, water resources, utilities, land uses, aerial photos, streets, topography, zoning, tax lots, buildings, and private stormwater facilities.
- Water quality data from surface water or stormwater monitoring programs.
- Record drawings (as-builts) for stormwater facilities that require rehabilitation or replacement (if applicable and available).
- Information on groundwater resources, including wellhead protection areas.

- A synthesized list of historic CIP and basin-plan related stormwater projects. The list should identify incomplete projects, completed projects, success of the projects, and additional projects that are needed, if known.
- Information on planned developments, annexation areas, or land use changes from the Community Development Department.
- Information on the City's existing storm and surface water operations and maintenance program.
- Existing modeling data on the City's stormwater system and drainage basins within the City, if available.
- Background information on the City's current stormwater utility fee and other information related to financial policy.

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Des Moines Surface Water Comprehensive Plan
Responses to Questionnaire 1

Question	Response 1	Response 2	Response 3	Response 4	Response 5	Response 6
If you had to list one (1) single objective of the surface water comprehensive plan development process, what would it be?	No response	To identify capital improvement project needs, as well as operation and maintenance needs to support the utility comprehensively for the next 20 years. Tbis in turn will drive updated SWM utility Rate based on a qualified Rate Study. It is imperative that the City Council Environment Committee members understand early on in the process that the operations and maintenance performance levels that they select, will in the end determine the utility rates.	To create a plan that has a balanced focus on preventing flooding, erosion, sedimentation, water quality, and habitat degradation, and to protect, restore, and enhance all surface waters.	Public awareness of how home owners businesses, and the public sector, and all motor vehicle owners affect local waters habitat and Puget Sound all the way out to the Pacific Ocean. After recently watching someone stuffing garbage down through the storm grate at Pacific HighwayS. and S. 216th ST we need to reach and teach the Public.	To devise an acceptable level of service for the program that is sufficient to meet the needs for the SWM program for the next 10 years. This level of service needs to at least meet the mandated requirements for the program, ensure that the system is appropriately maintained, provides funding for new improvements and replacement of the existing improvements when the useful life has been expended. The plan should be forward thinking and embraces technological advances to improve all aspects of utility.	Establish definite guidelines and processes for inspecting storm water facilities, and where necessary, specific components of the facilities, e.g., control structures, overflows, flow gate operations. Additionally, addressing how and what type of penalty to assess to owners of private facilities, who neglect to keep their facility at a reasonable maintenance standard. Also, defme what reasonable standards are.
Our team needs to collect as much background data as we can in a very short time frame to develop a comprehensive understanding of the City's existing storm sewer system, maintenance policies, guidelines, goals, and objectives. Can you identify existing documents, policies or practices that may be relevant to our understanding of your collective surface water system?	Response 1 provided an extensive comment to this sections regarding the Current Comprehensive Plan Policies (expected to be updated by the end of 2014, early 2015). Read text in purple located in word document with title "02-13-14 Questionnaire_R1.docx"	City of Des Moines Comprehensive Plan, DMMC Titles 11 and 16.	• King County Surface Water Design Manual For adopted maintenance standards, allowed LID impact techniques, technical standards for stormwater site and erosion control plans • City of Des Moines Website - City Code/SWM Department • IDDE Ordinance- http://www.desmoinesarchives.us/documents/ordinances/DESMCIT0200908131463.pdf • Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments - IDDE Field Screening Methodology	Mapping of all private and public storm systems in GIS. To identify all drainage Facilities either public or private. All mapping of Storm Sewer meets the NEPDES requirements.	A SWM Plan was started in (1997?) but never completed that may be useful to review. An efficiency study was also done on the utility in 2006. Street sweeping is considered a SWM function. SWM maintenance crews are to visually inspect the system on the maintenance cycle and report any problems. A flood watch list has been developed to visit sites before, during and after major storm events. Staff is working to place these locations on GIS as reference. The City does not provide any maintenance services for private systems or private streets; however, Huntington Park was added to the City street sweeping contract with 100% reimbursement of the services. The City would like to collaborate with the adjacent jurisdictions in hiring a maintenance contractor that could provide services for private systems thereby saving through economy of scale.	Determine maintenance and inspecting frequency for storm water facilities and components. · For example, the city has approved the installation Contech storm water products. Becoming familiar with the methods used by Contech for inspecting, maintaining, and what event would require replacing any of their products. Insuring Contech's methods are in line with permitting directives.
Are you aware of any persistent/existing surface water or storm sewer problems where repairs have been made but additional work should be done to fix the problem? If so, is there documentation of those problems at the City (e.g. record drawings, notes, calculations, reports, studies, etc.)?	No response	• What is to be done with the Barnes Creek wetland area? • 24th Avenue South in the vicinity ofParkside elementary. What is to be done with old CMP? • What is to be done with deep roadside ditches? • Des Moines Memorial Drive -sliding (north hill drainage) Coordination issues with the City of Normandy Park. • O&M manuals and SOPP for our large storm ponds and vaults. Training for maintenance staff. • Policies related to Huntington Park and other private property.	No response	None at this time.	A number of problems have been identified in the several basin studies and many of the recommendations have been implemented. For the most part the flow issues have been addressed and we now need to focus on the conveyance systems and water quality. A substantial portion of the system is comprised of old CMP pipe that needs to be replaced and there are many deep roadside ditches along arterials that present safety hazards that need to be piped. Many roads also lack any roadside drainage system at all that often create water nuisances and complaints from the adjacent properties. We also need to evaluate all of the stream outfalls for downstream erosion and I would like to see if there is a means to provide some level of treatment or spill control for stream protection. For topographic reasons, there is a significant amount of drainage pipes located within private property that is difficult, if not impossible to maintain. In some instances, drainage easements are called out on the plat maps but it is not clear whether the easements are public or private. The CIP program needs to have sufficient funding to relocate some of these systems to within City ROW and abandon these easements (or convert them to private easements).	One location needing additional attention is the pond located at S246th Street and 27th Ave South. This facility is in need of extensive cleaning, vegetation control, maintenance, etc. The concerns at this facility make it difficult to assess the impact it will have or currently has on the existing conveyance system.
We have listed below the types of data and records we believe we need to collect in order to develop a comprehensive understanding of the City's current surface water system. Are there additional documents, studies, or modeling files that Parametrix did not request that you feel will benefit the comprehensive plan? If so, please list.	Comp Plan: http://www.desmoineswa.gov/DocumentCenter/View/71 SMP: http://www.desmoineswa.gov/DocumentCenter/View/199 CAO: http://www.codepublishing.com/wa/desmoines/html/DesMoines16/DesMoines1610.html#16.10	What about the new FEMA maps.	No response	No response	The Planning Department should provide a copy of the Shoreline Master Plan. The City Comprehensive Plan is also in the process of being updated - the Planning Department needs to coordinate and sync this effort with this SWM Plan. The City is also a partner with the WRIA 9 Forum that has prepared the Salmon Habitat Plan for this watershed. 2006 Efficiency Study. The draft 1997 (?) SWM Plan.	No response

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CITY OF DES MOINES SURFACE WATER COMPREHENSIVE PLAN

Questionnaire 2 – Identifying the City's Stormwater Needs

PURPOSE

The purpose of this questionnaire is to identify specific surface water problems. The content of this questionnaire will be used to guide a workshop discussion between City staff and our consultant, Parametrix, which will take place on Monday, March 24th.

The goal of the workshop will be to develop a list of known problems within the City so that we can investigate and develop solutions that will be the basis of a construction/capital improvement plan.

RESULTS OF QUESTIONNAIRE 1

The following is a summary of the input provided from Questionnaire 1[1]:

Identified Issues	Goal/Proposed Approach	Examples/Observations (if applicable)
Update the operation and maintenance (O&M) tracking system	Data collection software to be updated and use of field electronics to be implemented	Hand-held tablets/iPads, need software suggestions
City has aging storm system consisting of degraded CMP	Need to begin replacing CMP proactively, not reactively	Most of existing SWM CIP list consists of pipe replacements/upgrades
City has deep roadside ditches that may pose a safety risk on some local roads and arterial streets	Fill ditches and install enclosed drainage systems	Potentially merge ditch replacements with sidewalk installations.
Public outreach and education improvements		Staff witnessed citizen "stuffing garbage down a storm grate at Pac Hwy and S 216th St"
Surface Water Comprehensive Plan should be forward thinking document that is relevant/applicable for 10+ years	Should address O&M needs, CIP projects, and SWM utility rates	
Resolve public/private ownership of Stormwater easements	Determine who maintains SW facilities and who pays for CMP replacements	
Please list additional drainage problems that are not covered in the attached document.		Ex: Are there current flooding or water quality issues? If so, where?
Keeping up with growth	Track increase of SWM Fees and direct those funds to additional staffing/equipment	

[1] A list of outstanding projects from the Stormwater Capital Improvement Projects and NPDES Phase II Stormwater Management Program are attached on a separate sheet.

QUESTIONNAIRE 2

The following table lists criteria that may be used to prioritize future drainage improvement projects. Please select what you think are the three most important criteria and rank them from 1 to 3 (1 being the most important):

Project Selection Criteria	Importance (Top 3)
Improvements spread throughout the City/at least one project in each neighborhood and/or stream area	
Maintain/improve the existing drainage pipe system	
Addressing landslide/ground settling/seepage/erosion problems	
Use of more “natural-based” approaches to rainwater management (green stormwater infrastructure/low impact development)	
Removing pollutants from rainwater runoff	
Ditch removals	
Stream enhancements/wildlife habitat/fish access improvements	
Reduce/eliminate flooding	
Funding: spend money where it will result in the largest overall impact	
CMP Pipe Replacement	
Other:	

Do you know of any opportunities for or limitations against use of “natural-based” approaches to rainwater management (green stormwater infrastructure/low impact development)?

Please describe any other areas/topics that you feel should be included in future drainage system planning, such as annexation of new areas, coordination with surrounding jurisdictions, etc.

OPERATION & MAINTENANCE-SPECIFIC QUESTIONS

Regarding the City's operation and maintenance (O&M) practices for City-owned stormwater facilities (pipes, catch basins, ponds, ditches, etc.), what are some of the most effective current practices?

What O&M practices would you like to see changed, if any?

Regarding the City's pollution prevention procedures (e.g., street sweeping, catch basin cleaning, etc.), what do you think are some of the most effective current practices?

What pollution-prevention practices would you like to see changed, if any??

The City will likely start collecting field data electronically through the use of hand-held devices (i.e. tablets, iPads, etc.). Do you know of any existing software that you would recommend? Do you have colleagues at other Cities that might have recommendations?

Do you know of any specific areas and/or stormwater facilities (pipes, catch basins, ponds, ditches, etc.) are in need of rehabilitation?

Are there any other issues/topics that you would like included for consideration in future drainage system planning?

YOU'RE INVITED:
RAINWATER AND YOUR UTILITY BILL

The City of Des Moines uses the money from stormwater fees that you pay in your utility bill to maintain the drainage system and rainwater management facilities in your neighborhood. This money goes toward things like:

- **Flood Control**
- **Pipe and Ditch Replacements**
- **Stream Health**

The City is working on a future plan for management of your surface water facilities and **would like your input!** Please join the City at one of several **public meetings.**

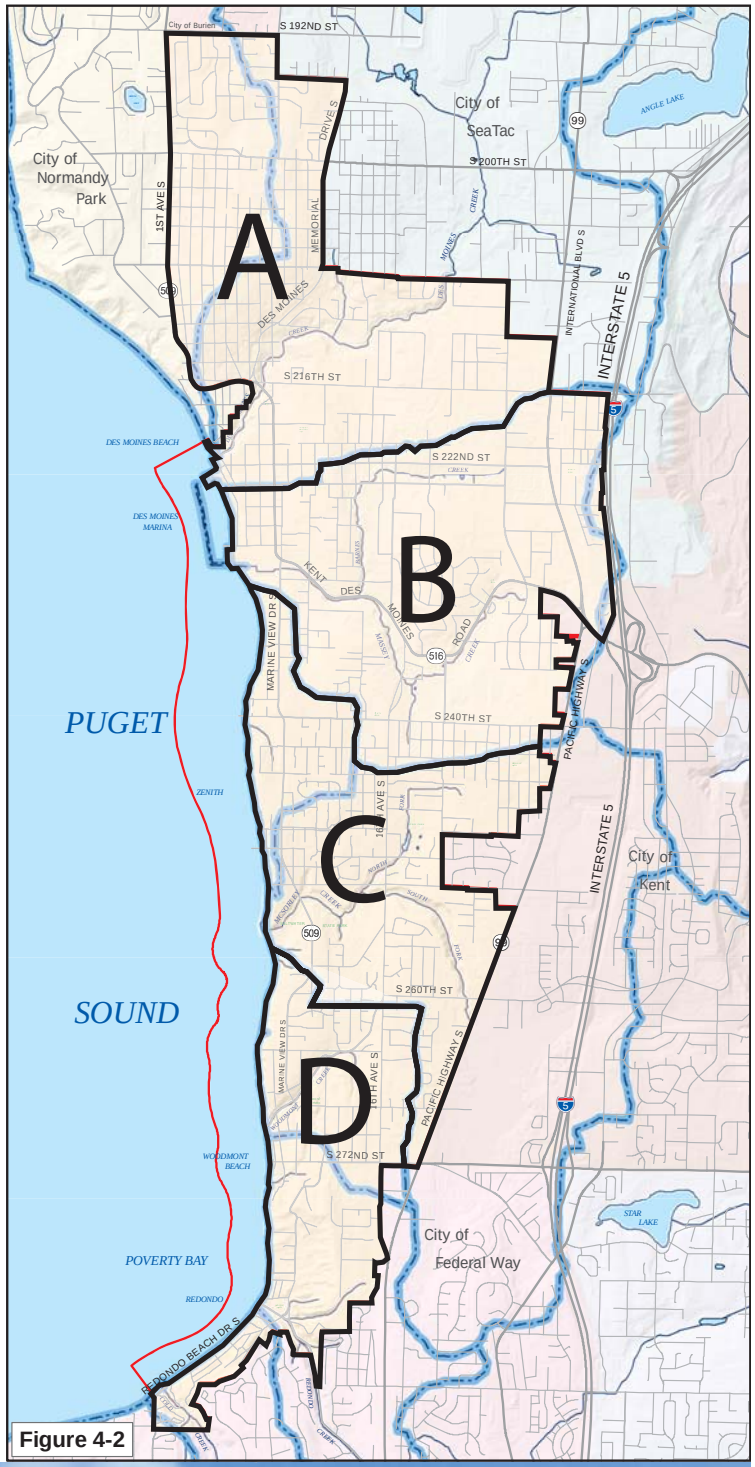

Figure 4-2

WHAT HAS THE CITY DONE SO FAR?

The Surface Water Management Division has already reviewed data on the current surface water management program, conducted several surveys of City staff who work on managing surface water, and met with the Environment Committee. A draft list of potential surface water management projects and ranking criteria have been developed and we need your input!

HOW DO I FIT IN TO THIS PROCESS?

The City would like to invite you to attend a public meeting in your drainage area to provide input on what is most important to you for future stormwater spending. For example, should we select projects first that reduce flooding or keep pollutants out of the water? Should the rainwater management projects all be selected based on the most extreme problems, even if that means there is no project in your neighborhood? These and other issues will be discussed at each meeting.

PUBLIC MEETINGS:

Meeting will be held in each of the Basin Areas noted on the map above. If you are unable to attend the meeting for your area, please attend one of the others.

Area A: May 19, 2014, 5:30 – 7:30 pm
Area B: May 20, 2014, 5:30 – 7:30 pm
Founders Lodge at the Beach Park
22030 Cliff Ave S, Des Moines

Area C: May 29, 2014, 5:30 – 7:30 pm
Area D: May 30, 2014, 5:30 – 7:30 pm
Woodmont Elementary School
26454 16th Ave S, Des Moines

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1 WELCOME!

PUBLIC MEETING: SURFACE WATER COMPREHENSIVE PLAN

The City of Des Moines uses the money from stormwater fees that you pay to maintain the public drainage system and rainwater management facilities in your neighborhood. This money goes toward things like:

- **Flood Control**
- **Street Pipe and Ditch Maintenance**
- **Water Quality and Stream Health**

The City is working on a future plan for management of your surface water facilities and **would like your input!**

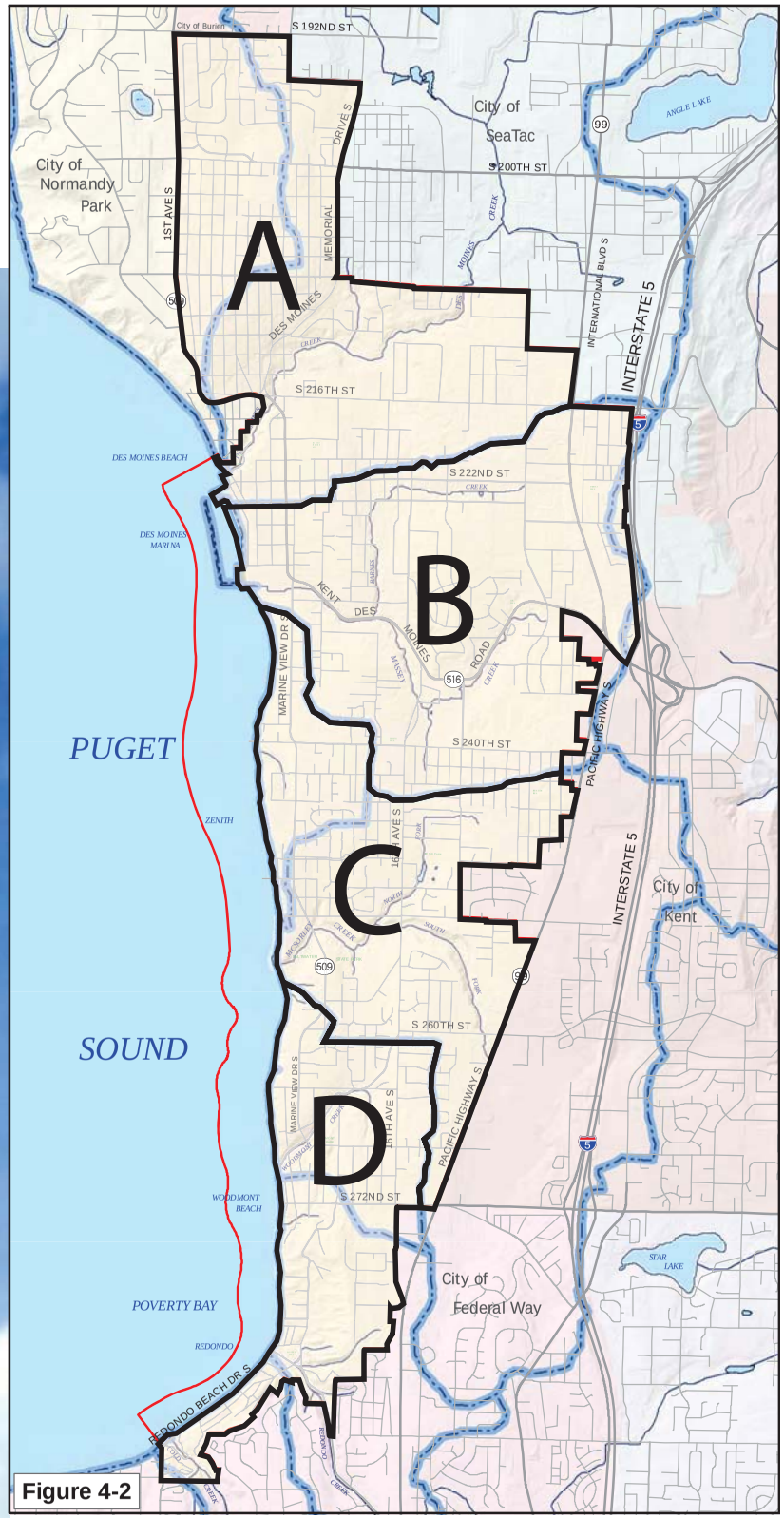
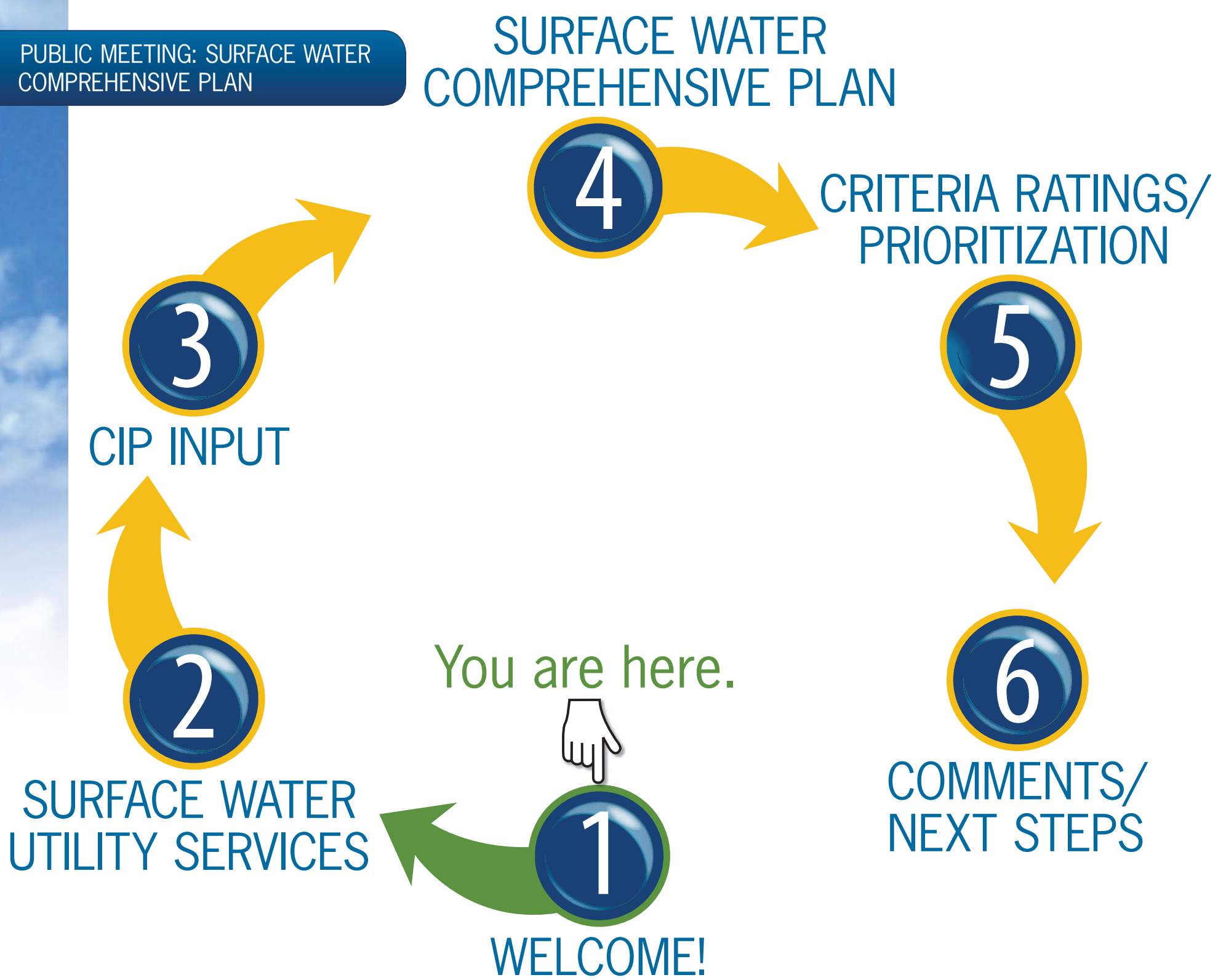


Figure 4-2

PUBLIC MEETING: SURFACE WATER COMPREHENSIVE PLAN



2 SURFACE WATER UTILITY SERVICES

CLEAN WATER AND HEALTHY STREAMS

Monitoring/Water Sampling: Collecting water samples from ditches, pipes, and streams.

Illegal Connections: The City detects and removes illegal connections of sewer/wastewater, and works to eliminate spills.

Car Wash Kits – Environmentally Friendly: Free kits for charities, to keep car wash water out of the storm drain. Car wash water contains soap, gasoline, oil, and other car pollutants. If it goes down the storm drain, it travels to streams, wetlands, and the Puget Sound, where it poisons aquatic life.

More Info: http://charitycarwash.org/

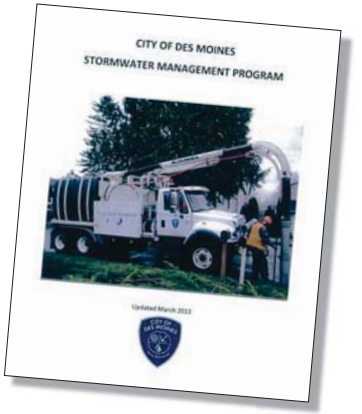
How to Help At Home: Remember – Driveway car washing is one of the most environmentally unfriendly chores around the house! Use these options instead:

- Go to a commercial car wash station.
- Wash your car on gravel, grass, or other surfaces that will soak up the water.
- Use hoses with nozzles that automatically shut off when not in use.

Storm Drain Marker Volunteer Program: We need volunteer(s) to place "Puget Sound Starts Here" markers near catch basins in your community. Help raise awareness about pollution, help stop illegal dumping down our drains, and protect Des Moines streams, wetlands, and Puget Sound!

STATE PERMIT SERVICES PROVIDED BY CITY

(Current Permit Expires July 2018)



2 SURFACE WATER UTILITY SERVICES

PREVENTING FLOODING

Controlling Runoff: Control and reduce high flows and pollution in rainwater runoff from roads, parking, buildings, and construction sites.

Operations and Maintenance: Train staff and prevent pollution from city operations.

Pipe Program: Public Works crews provide the heavy equipment and labor to install pipes, catch basins and backfill material (gravel) to replace ditches if the owner pays for the materials. Some restrictions apply.

INCLUDING YOU IN THE PROCESS

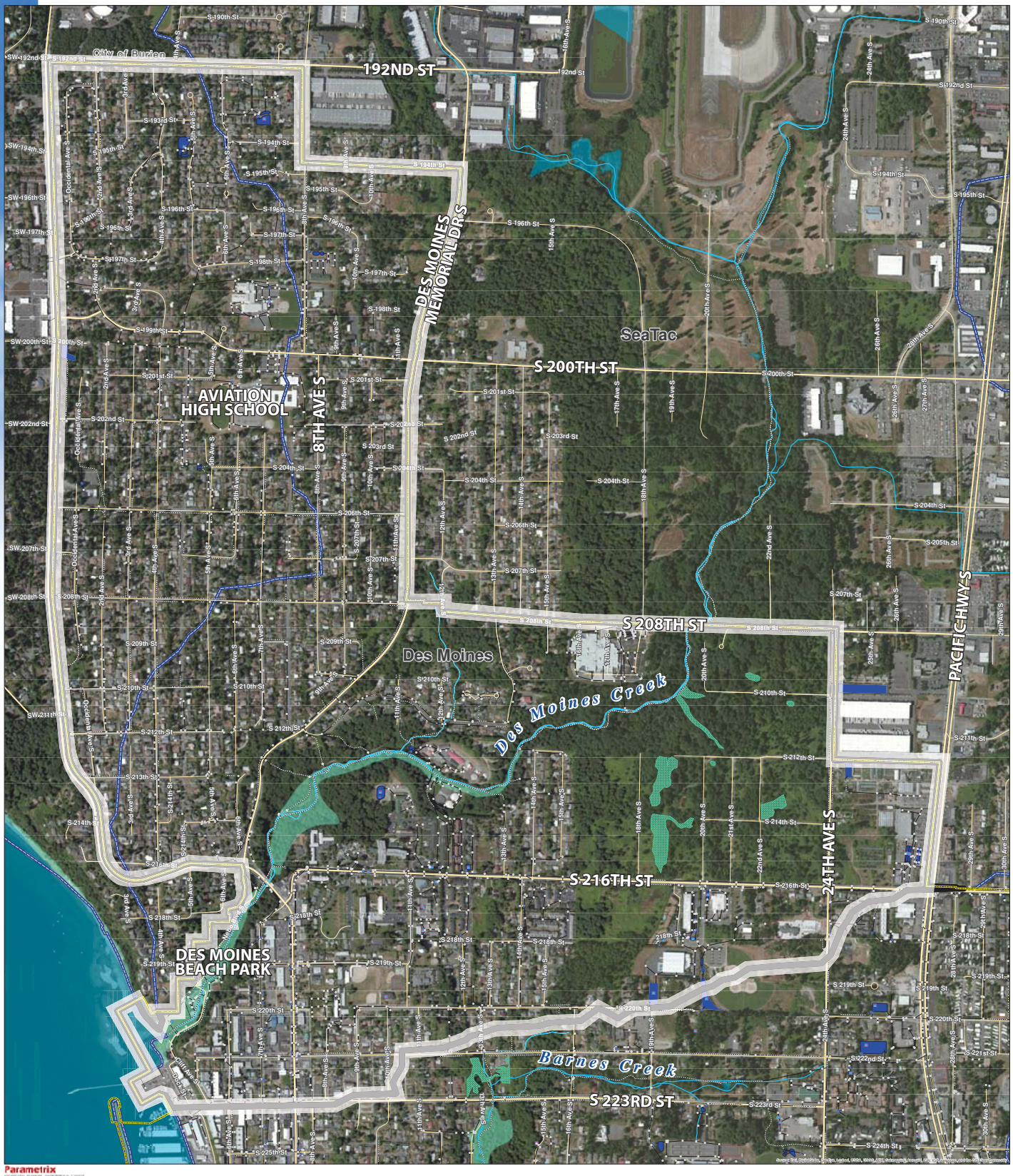
Public Education and Outreach: Website information, City Currents newsletter, brochures, and public signs.

Public Involvement and Participation: Friends of Des Moines Creek, salmon habitat recovery, and other volunteer events.

Please report any illegal storm drain dumping activities! For more info please call 206.870.6585. For the after hours hotline, please call 206.550.5612.

PUBLIC MEETING: SURFACE WATER COMPREHENSIVE PLAN

3 CIP INPUT



Parametrix

N

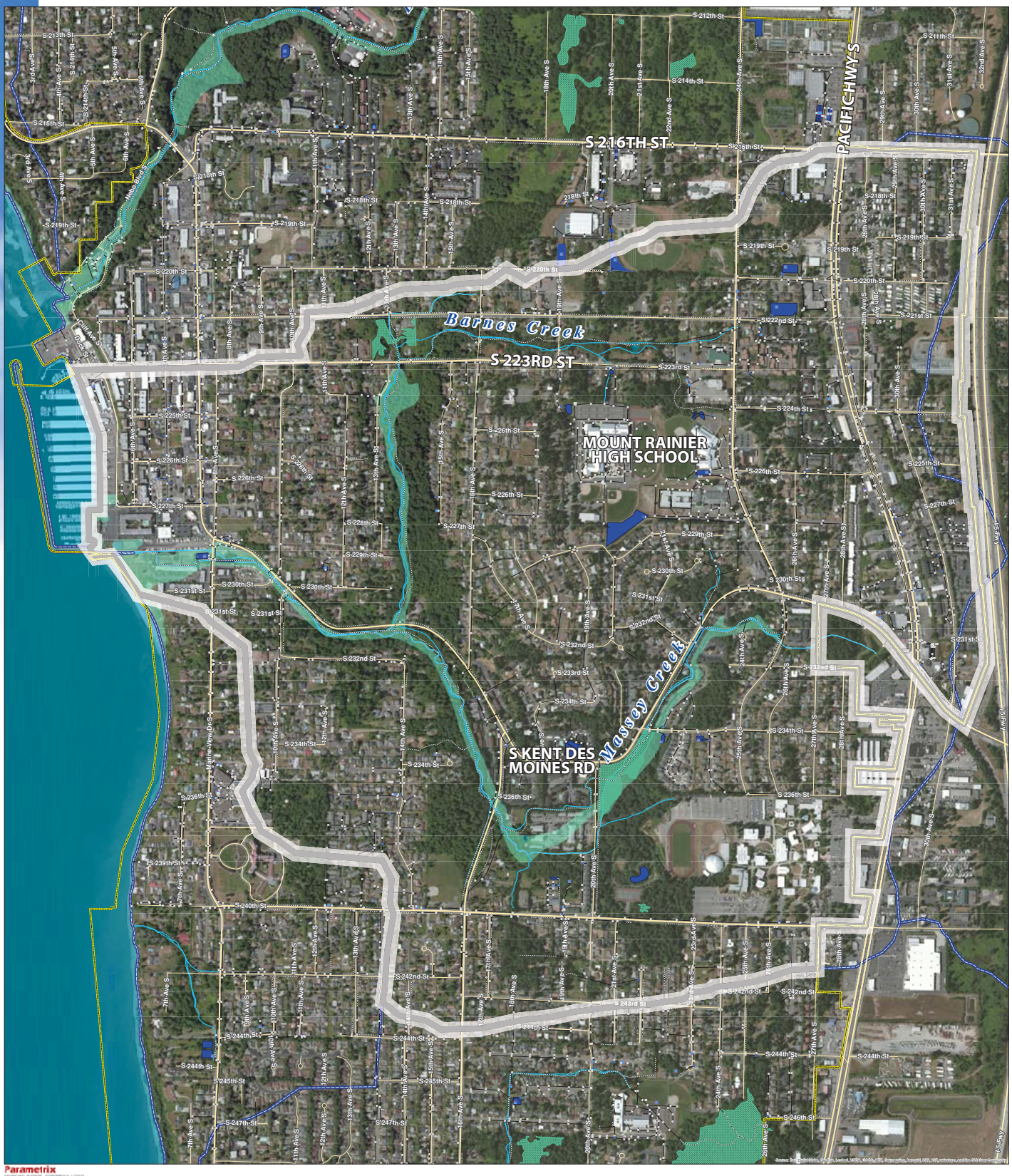
0 500 1,000 1,500
Feet

- Streams
- Surface Water
- Wetlands
- 100 Year Flood Area
- Drainage Basins
- Storm Discharge Point
- Storm Control Structures
- Storm Catchments
- Storm WQ Facility
- Storm Open Drain Lines
- Storm Conveyance
- Storm Detention Area / Easement
- City Limits
- Interstate
- Arterial
- Collector
- Focus Area A

City of Des Moines Area A

PUBLIC MEETING: SURFACE WATER COMPREHENSIVE PLAN

3 CIP INPUT



Parametrix

N

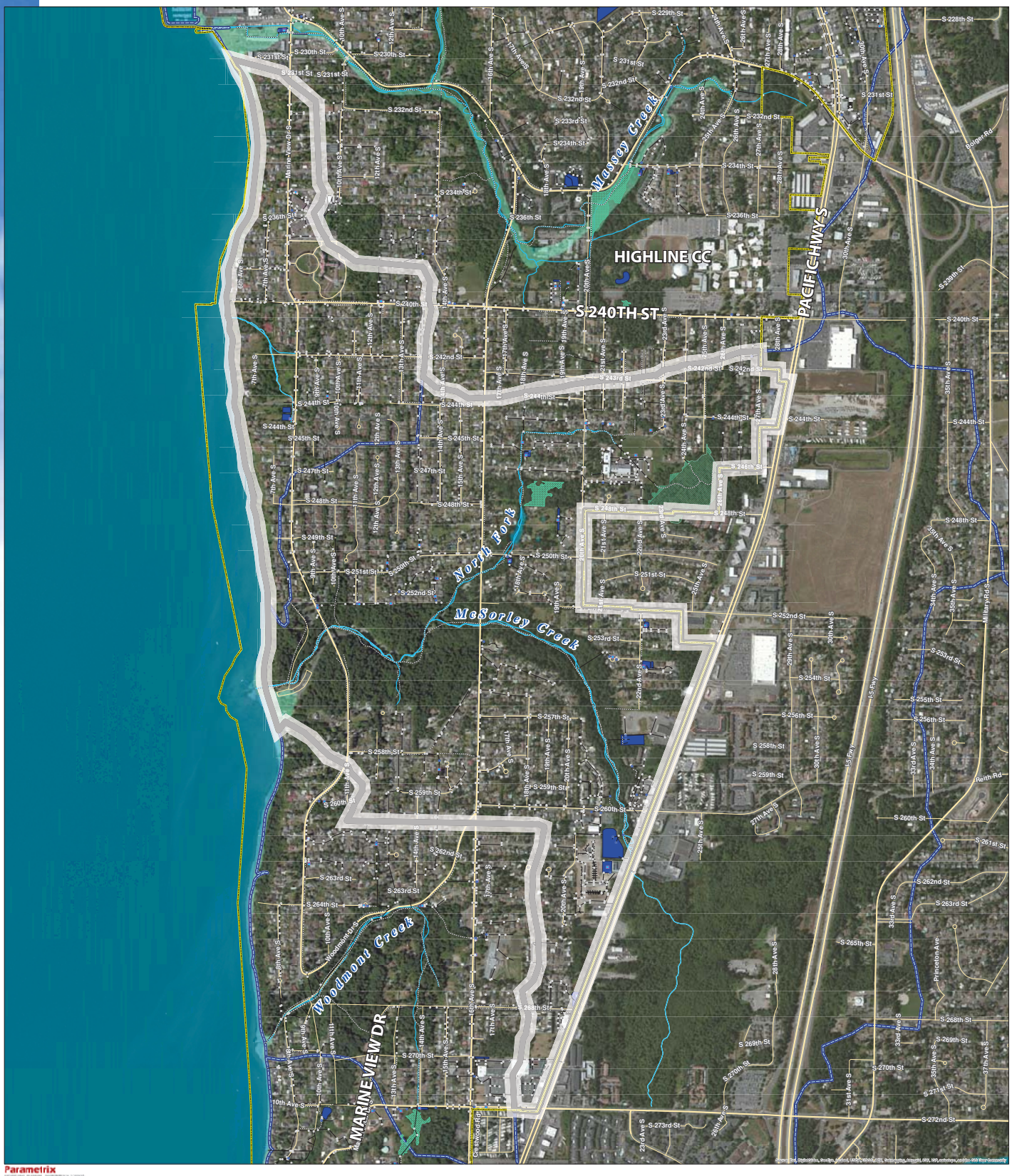
0 500 1,000 1,500
Feet

- Streams
- Surface Water
- Wetlands
- 100 Year Flood Area
- Drainage Basins
- Storm Discharge Point
- Storm Control Structures
- Storm Catchments
- Storm WQ Facility
- Storm Open Drain Lines
- Storm Conveyance
- Storm Detention Area / Easement
- City Limits
- Interstate
- Arterial
- Collector
- Focus Area B

City of Des Moines Area B

PUBLIC MEETING: SURFACE WATER COMPREHENSIVE PLAN

3 CIP INPUT



Parametrix

N

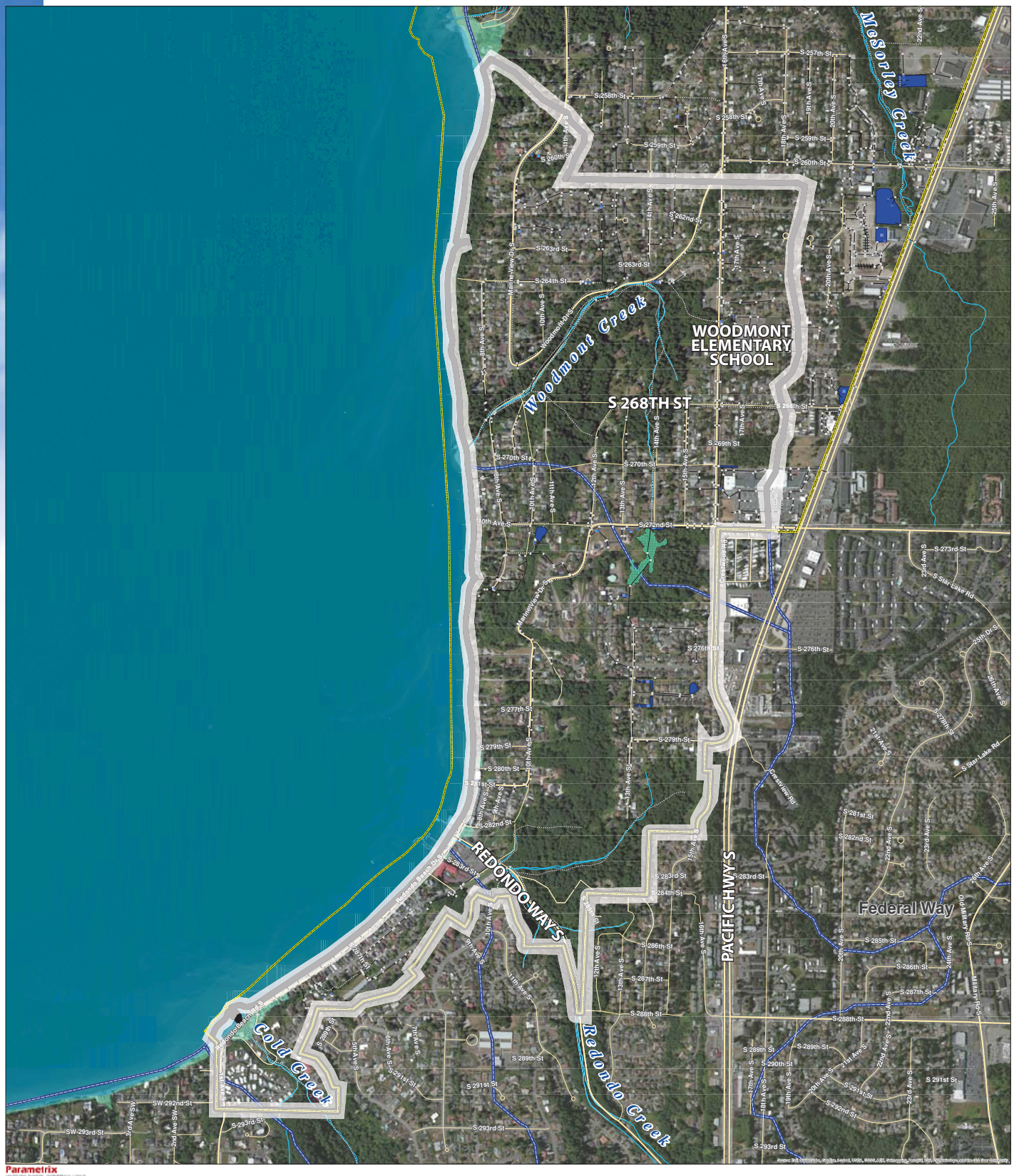
0 500 1,000 1,500
Feet

- Streams
- Surface Water
- Wetlands
- 100 Year Flood Area
- Drainage Basins
- Storm Discharge Point
- Storm Control Structures
- Storm Catchments
- Storm WQ Facility
- Storm Open Drain Lines
- Storm Conveyance
- Storm Detention Area / Easement
- City Limits
- Interstate
- Arterial
- Collector
- Focus Area C

City of Des Moines Area C

PUBLIC MEETING: SURFACE WATER COMPREHENSIVE PLAN

3 CIP INPUT



Parametrix

N

0 500 1,000 1,500
Feet

- Streams
- Surface Water
- Wetlands
- 100 Year Flood Area
- Drainage Basins
- Storm Discharge Point
- Storm Control Structures
- Storm Catchments
- Storm WQ Facility
- Storm Open Drain Lines
- Storm Conveyance
- Storm Detention Area / Easement
- City Limits
- Interstate
- Arterial
- Collector
- Focus Area D

City of Des Moines Area D

4

SURFACE WATER COMPREHENSIVE PLAN

This document will layout the plan for how the City will spend your stormwater utility fees for the next 10 years.

Goals:

Improve and Maintain Drainage: Safeguard public safety and prevent flooding and property damage, correct existing problems, and accommodate future building projects.

Keep Rainwater Runoff Clean: Control and prevent pollutants from going down the storm drains.

Protect Habitat: Ensure that Des Moines streams, wetlands, and Puget Sound shorelines are healthy and full of fish.

Proactive, Not Reactive: By making a budget and plan in advance, the City is able to spend your utility fees in the best manner possible. This includes quick response to emergencies like broken pipes and flooding, saving up funds over time to buy new equipment for crews, and planning ahead to partner with other City departments on big development projects.

PUBLIC MEETING: SURFACE WATER COMPREHENSIVE PLAN

4

SURFACE WATER COMPREHENSIVE PLAN: DEVELOPMENT PROCESS

GATHER INFO

Review Reports and Data

Staff Questionnaires

Staff Meetings & Workshops

CITY/PUBLIC INVOLVEMENT

City Council Environment Committee

Public Meetings

Regulatory Review

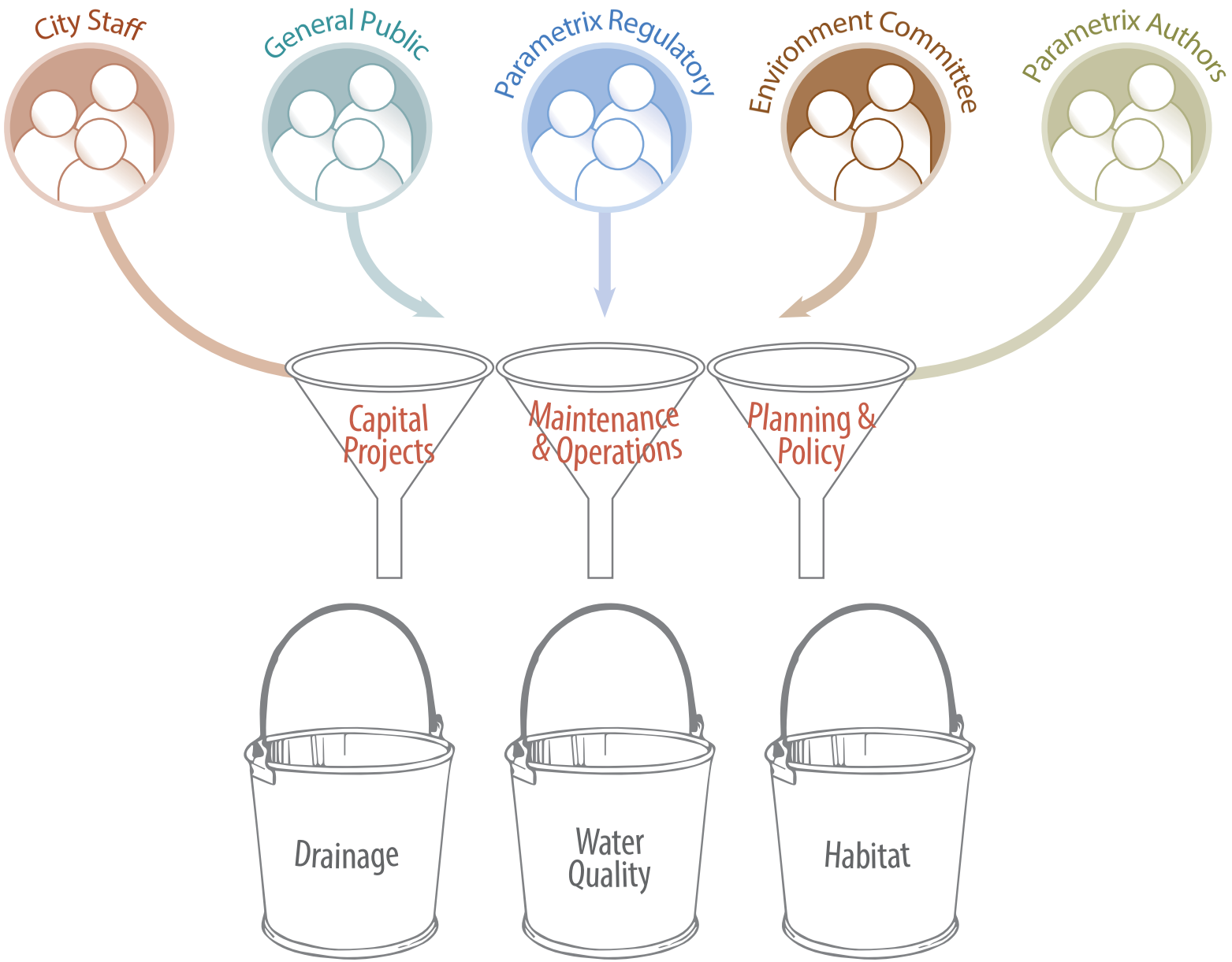
SWCP DOCUMENT

Needs Assessment

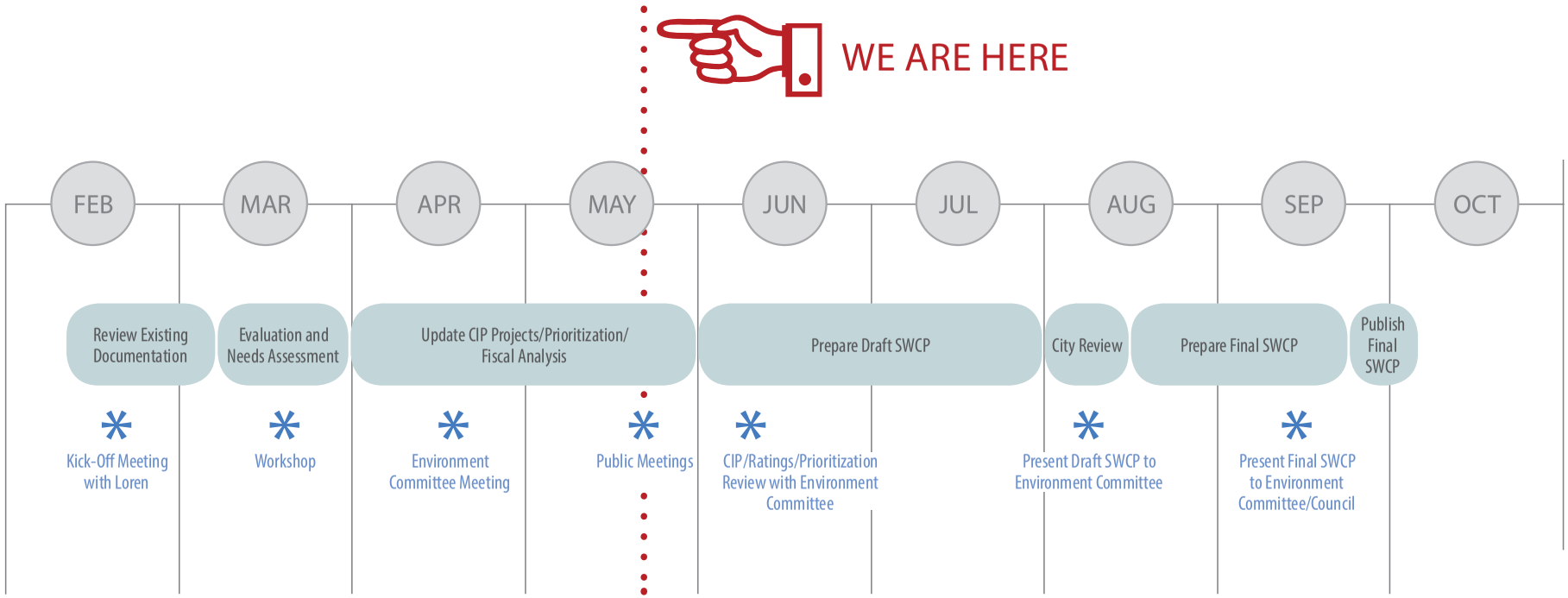
Stormwater Rate (Utility Fee) Analysis

Project Selection and Ranking

4 SURFACE WATER COMPREHENSIVE PLAN: PERSPECTIVES



6 COMMENTS/NEXT STEPS



Public Meetings

Area A:
May 19, 2014, 5:30 – 7:30 pm
Founders Lodge at the Beach Park
22030 Cliff Ave S, Bldg A, Des Moines

Area B:
May 20, 2014, 5:30 – 7:30 pm
Founders Lodge at the Beach Park
22030 Cliff Ave S, Bldg A, Des Moines

Area C:
May 29, 2014, 5:30 – 7:30 pm
Woodmont Elementary School
26454 16th Ave S, Des Moines

Area D:
May 30, 2014, 5:30 – 7:30 pm
Woodmont Elementary School
26454 16th Ave S, Des Moines

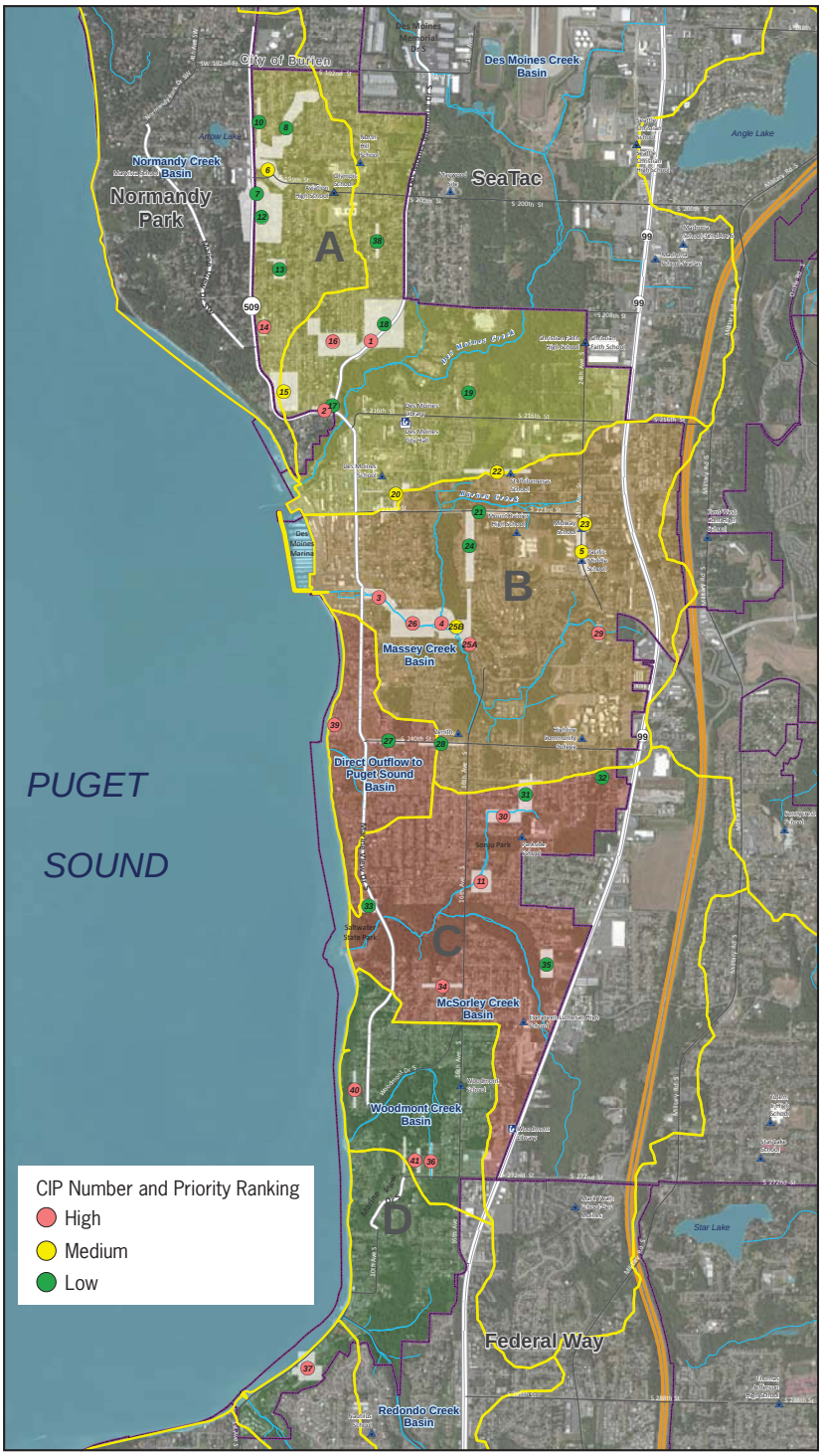
YOU'RE INVITED:
RAINWATER AND YOUR UTILITY BILL

The City of Des Moines recently held public meetings in May. We invited you to attend one of four public meetings to provide input on what was most important to you for future stormwater spending.

WE HAVE COMPILED THE RESULTS
from the meetings and have updated our list of projects and programs based on your input and input we received from City staff and the Environment Committee.

WE WOULD LIKE TO SHARE these
results with you and again ask for your input so that we can continue to develop a solid plan for the future management of stormwater in Des Moines.

PUBLIC MEETING:
September 17, 2014, 5:30 – 7:30 pm
Des Moines Activity Center
2045 216th S, Des Moines



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UPDATE FROM THE PUBLIC MEETINGS

Location		Comments								
Area	Attendees	Reduce Flooding/ Flooding Complaint	Replace Ditches	Public Involvement	Maintenance Issue	Funding	Water Quality	Habitat	Geographic	Unrelated
A	11	2			1		1			1(Sidewalk Request)
B	12	1	1							
C	15	4				1		2	1	1(Landslide Risks)
D	18	6		1						
Totals	56	13	1	1	1	1	1	2	1	2

PRIORITIZATION CRITERIA

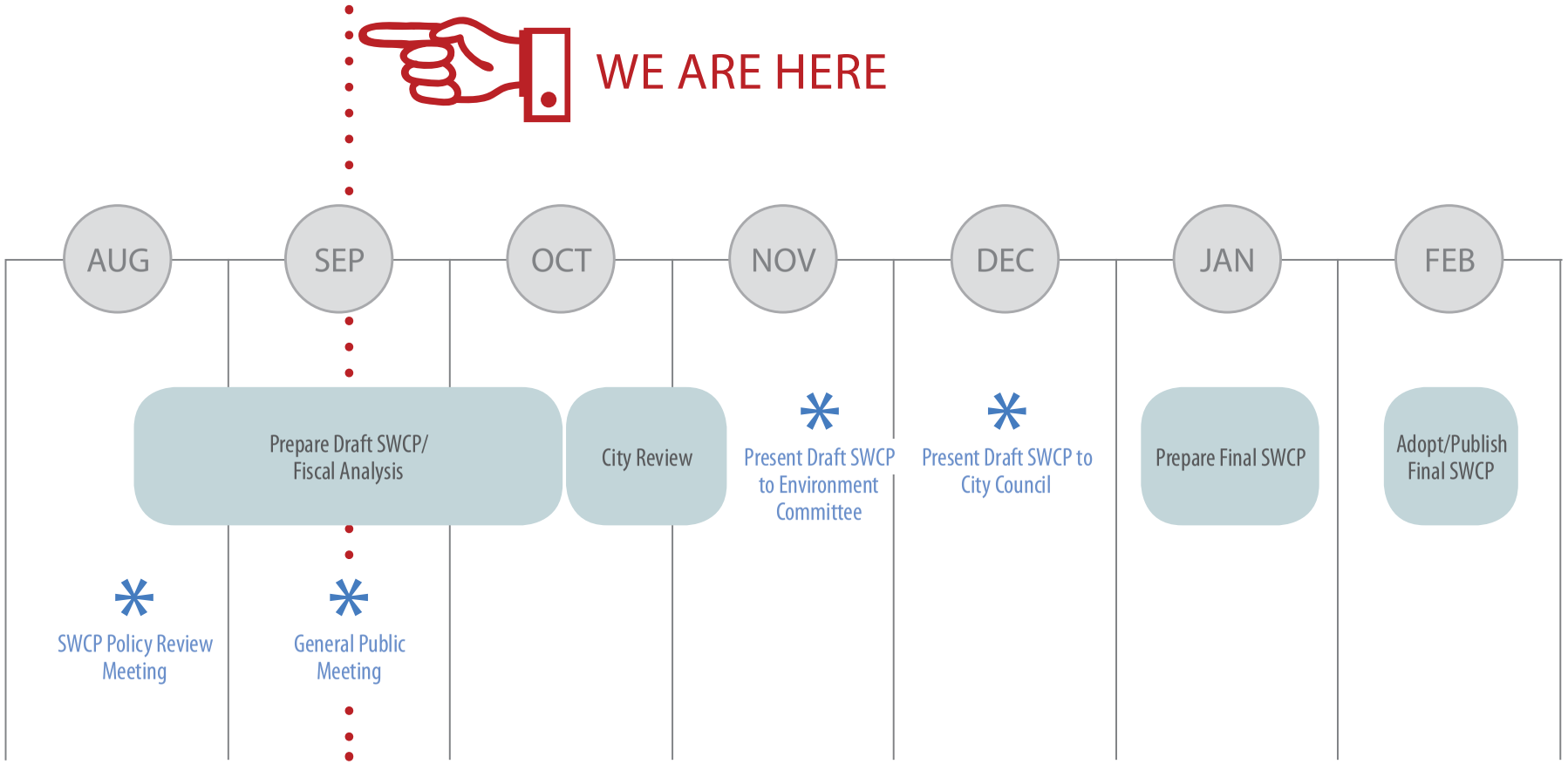
		Workshop Results	City Council EC Results	Public Meeting Aggregate Score	Parametrix Regulatory Review Results	Compiled Results
Criteria Rating - wording for workshop and EC Coucil	**Criteria Rating - wording for Pubic Meetings**	**Group Rating**	**Group Rating**	**Group Rating**	**PMX Rating**	**Group Rating**
Funding: spend money where it will result in the largest overall impact	Funding: ... how willing would you be to pay a higher stormwater utility fee if it meant faster and more complete improvements to drainage, water quality, and habitat (streams & wetlands)?	H	H	H (7); M (5); L (10)	L	H
Maintenance/Inspection: improve the existing drainage pipe system	Maintenance/Inspection: ...how important is it that the City spend more time and money maintaining the existing drainage system?	H	H	H (16); M (7)	H	H
CMP Pipe Replacement	CMP Pipe Replacement: ... the City inherited thousands of feet of corrugated metal pipe that was installed by King County. This pipe is nearing the end of its useable life and many systems may fail in the near future. How important is it that the City spend more time and money to replace this failing pipe?	M/H	H	H (18); M (4); L (3)	LM	H
Ditch Removal	Ditch Replacement: ...how important is it that the City spend more time and money to replace roadside ditches that may pose safety risks by either installing pipe and filling them in or by constructing shallower swales to convey runoff?	M	M	H (12); M (9); L (2)	MH	M
Preventing Pollutants: Removing pollutants from rainwater runoff	Water Quality: ...how important is it that the City spend more time and money on removing pollutants from rainwater runoff before it is discharged into our streams and Puget Sound?	M	MH	H (13); M (5); L (2)	H	H
Geology: Addressing landslide/ground settling/seepage/erosion problems	Geology: ...how important is it that the City spend more time and money to reduce the risk of landslides, ground settling, seepage, or erosion problems?	L/M	M	H (24); M (2)	LM	M
Reduce/Eliminate Flooding	Reduce/Eliminate Flooding: ...how important is it that the City spend more time and money to reduce or eliminate flooding?	L/M	M	H (22); M (3); L (2)	M	M
Environmental: Stream enhancements/wildlife habitat/fish access improvements	Environmental: ...how important is it that the City spend more time and money to provide new wildlife habitat, habitat improvements, fish access to stream reaches, or stream enhancements?	L	M	H (6); M (2); L (10)	LM	L
LID: Use of more "natural-based" approaches to rainwater management (green stormwater infrastructure/low impact development)	LID: ...how important is it that the City focus on using a more "natural-based" approach to rainwater management (green stormwater infrastructure/low impact development)?	L	M	H (6); M (8); L (6)	H	M
Geographic: Improvements spread throughout the City/at least one project in each neighborhood and/or stream area	Geographic: ...how important is it to you that the City spend time and money to work on surface water issues evenly in each neighborhood/drainage area?	L	L	H (3); M (10); L (3)	L	L
Other Criteria (Added During Workshop): Safety	Safety: ...how important is it that the City spend more time and money to improve pedestrian or traffic safety to a level beyond what it is now?	H	H	H (9); M (6); L (5)	L	H
Other Criteria (Added During Workshop): Public Education / Public Involvement	Public Education / Public Involvement: ...how important is it that the City spend more time and money to inform the Des Moines citizens about surface water management? (Does the City need to increase public awareness? Do citizens want to get involved?)	M/H	M/H	H (3); M (10); L (4)	H	M
Other Criteria (Added During Workshop): Regulatory Requirements	Regulatory Requirements: ...how important is it that the City spend more time and money to satisfy surface water legal requirements (State surface water [NPDES] permit for cities, City ordinances, etc.)?	M	M	H (3); M (6); L (7)	H	M

Rating:	Rating:
High	High
Med/High	Med/High
Med	Med
Low/Med	Low/Med
Low	Low

SERVICE LEVEL MATRIX

SERVICE LEVEL	PROGRAM ELEMENT				
	Planning & Engineering	**Inspections & Maintenance**	**NPDES**	**Administration**	**Capital Improvement Projects**
Description of Expense Activities	Engineering staff salaries, supplies, and specific responsibilities required of the engineering department (stormwater comprehensive plan, annual SWMP update, etc).	Routine system inspections and maintenance (includes NPDES-required): field crew staff salaries, equipment, interfund transfers for repairs, etc.	Implementation of NPDES Permit program: monitoring, permit fees, public outreach, and program-specific administration. - SWMP document updates included under Planning & Engineering - Inspections & Maintenance included under I&M Category	Non-element-specific support: support staff salaries, state taxes, utility taxes, and miscellaneous expenses.	Large-scale construction, expansion, renovation, or replacement project; purchase of major, long-term use equipment; or major long-term maintenance, repair, or rehabilitation project.
$14.24	**$3.07**	**$5.22**	**$1.61**	**$0.91**	**$3.43**
% of Revenue Req.	**22%**	**37%**	**11%**	**6%**	**24%**
CURRENT	● 2.80 FTE ● Design and manage CIP projects ● Permitting plan review. ● Respond/resolve drainage public drainage complaints ● Inspect construction projects; review, revise and adopt local development related codes, rules and standards to incorporate LID principles and BMPs.	● 5.90 FTE ● Currently able to provide annual maintenance for certain facilities, 6 mo. for CBs, 2 yrs for maintenance that requires capital construction < $25K, annual inspection of all treatment and flow control facilities, bi-annual inspection for certain vaults, manholes, and takes under Reduced Frequency Inspection	● 0.5 FTE Enigineer AIde and 0.2 FTE SWM Utility Manager (paid by NDPES Permit Program) Program includes: 1. Public Education 2. Public Involvement 3. Illicity Discharge and Detection 4. Control Runoff 5. O&M Tracking 6 & 7: (These permit elements N/A) 8. Monitoring 9. Annual Reporting		● The City performs a minimal amount of capital construction, funded by rates and fund balance. ● 2014 - 2019 has 9 projects being funded by SWM funds
Gaps in Existing Program *(Potential Considerations in Italics)*		● *May need to add 1 FTE or consider contracting services to increase inspection frequency* ● *Implement Electronic Record Keeping* ● *CCTV 15% of SD system/annually until complete*	*(Full-NPDES program review to be conducted)*		● Increase capital expenditures to build high priority projects with next 10 years ● Add a "Rainy Day" fund to capitol program for unanticipated drainage related issues
Recommendations	● Programmatic SEPA for Surface Water CIPs'● Prepare Project Management Manual or Project Management training for staff to effectively manage additoinal Surface Water CIPs				● Increase capital expenditures to build high priority projects within the next 5 years and medium priority projects within the next 10 years

SCHEDULE AND NEXT STEPS



Appendix B

Capital Improvement Plan

1 Purpose

One goal of the Surface Water Comprehensive Plan (SWCP) is to assess the City's aging stormwater infrastructure and develop a detailed Capital Improvement Plan (CIP) for the City's Surface Water Management program (SWM). The focus of the CIP is to identify and evaluate known problems and develop solutions. A key long-term solution is a plan for repair and replacement of aging stormwater infrastructure. To accompany the list of capital projects, the CIP includes a ranking system to provide a straightforward project prioritization framework specific to the City. This system is used to objectively evaluate projects and provide the City with a universal tool to score and rank projects now and in the future. Finally, the ranked capital project list presents a tiered expenditure approach where three levels of spending provide minimum, moderate, and high levels of service. This framework is used to prioritize the capital projects based on need and schedule them into horizons of 5, 10, 15 and 20 years. This approach captures the most important issues for the City while grounding the CIP financially.

The methodology, results, and recommendations for the developing the CIP and project ranking system are presented in subsequent sections of this appendix. The financial element of the capital expenditures is summarized in Section 3.2 below and a detailed discussion is presented in Section 4.3 of the SWCP.

2 Methodology

The CIP consists of two elements: 1) identification of surface water capital projects and 2) a ranking system for the City to objectively compare and prioritize capital projects. The capital projects list and ranking criteria were developed through a process that included data gathering questionnaires for the City staff, a workshop with the City staff, five public meetings for citizen involvement, and two presentations to the City Council Environment

Committee. The consultant facilitated these opportunities for involvement. This section describes the methodology for developing the capital project list and ranking system.

2.1 Project Identification

SWM capital projects are projects that are funded by SWM that improve at least one of the following:

- Drainage Infrastructure (i.e. increase pipe diameters to reduce flooding or erosion),
- Water Quality (i.e. stormwater treatment pond, bioswale), or
- Environmental Habitat (i.e. stream enhancement or restoration).

SWM capital projects do not include standard operation and maintenance activities (i.e. dredging ditches, replacing broken catch basin covers, etc.), or small drainage projects, which have construction costs less than $30,000. Further discussion regarding the capital project list is presented in subsequent sections.

To identify City drainage, water quality, and environmental habitat needs the consultant reviewed existing documents provided by the City. The list of documents is provided in Section 1.4.1 of the SWCP. In addition, the existing stormwater infrastructure was reviewed based primarily on GIS data provided by the City.

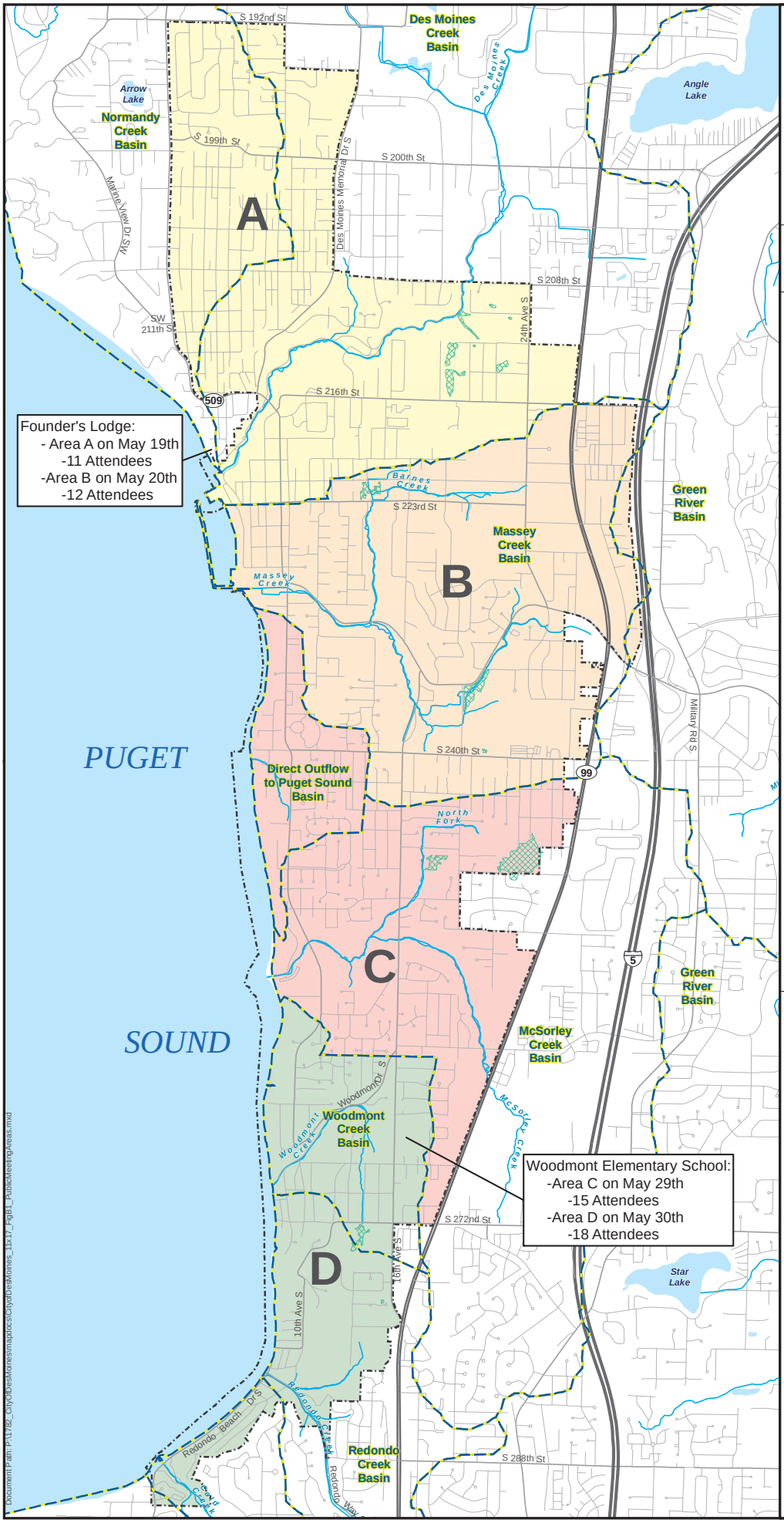
To accompany this data review the consultant solicited input from City staff, the local residents, and elected officials to further identify stormwater infrastructure needs and generate a list of capital projects. Discussion regarding the final capital project list, and estimated project costs is presented in Section 3 below.

2.1.1 Staff nominations

City staff have an integral knowledge of the needs of the stormwater infrastructure. City staff members provided input regarding City stormwater needs via completion of two questionnaires and attending one workshop to help identify stormwater projects. Members of the SWM engineering, planning, permitting, and maintenance departments participated in the questionnaires and workshop.

2.1.2 Public nominations

Four preliminary public meetings were held to provide an opportunity for residents to be involved in the SWCP. Each meeting was targeted to a focus area of city residents, although all residents were encouraged to attend any of the other three meetings if they had schedule conflicts. Advertisements were mailed to every City residence with a request for attendance and involvement. Focus areas (A, B, C, and D) were established based on drainage basins boundaries and the size of the relative areas (Figure B2.1). Meeting attendees were encouraged to talk with each other about neighborhood drainage issues, and then provide comments and nominate potential stormwater projects.



City of Des Moines

Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

Stream

Drainage Basin

Wetland

Focus Area
A
B
C
D

Des Moines City Limits

N

500 0 500 1,000
Scale in Feet

Source: City of Des Moines, King County

Figure B2.1.
Public Meeting Areas

Des Moines Surface Water Comprehensive Plan

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A fifth public meeting was held for all residents who attended one of the preliminary four public meetings. The purpose of this meeting was for attendees to review the draft capital project list and provide comments on a project or to nominate additional projects.

2.1.3 City Council Review

City Council approves budgets and is interested in where and how the City's only utility, Surface Water Management (SWM), is spending the funds generated by the residents. The Environment Committee was presented with opportunity for input on two occasions; first after the data gathering and workshop with the City staff, and second after the first four public meetings. At both meetings the Environment Committee reviewed the list of potential stormwater projects, and had the opportunity to add projects to the list.

2.2 Ranking Criteria

A ranking system was developed for this CIP. The ranking system consists of criteria or elements that are specific to stormwater projects. Each criterion is given a priority to determine which project elements are valued higher or lower in the viewpoint the City staff, local residents, and elected officials. This section discusses how the criteria were established and how the ranking for each criterion was established. Section 3, below, discusses how the ranking criteria are applied to the City's stormwater CIP.

2.2.1 Staff Involvement

City staff completed two questionnaires during the data gathering process. Project ranking criteria was introduced in the second questionnaire. The consultant provided an initial list of ten criteria that apply to surface water specific projects and City specific needs. The ten criteria are presented in Figure B2.2. It should be noted that the additional wording provided for the public meetings was verbally explained to the City staff and Environment Committee.

The workshop provided the City staff opportunity to rate each criterion with a high, medium, or low ranking. City staff rated the list of ten criteria as individuals, and then discussed their rankings in small groups. The small groups then presented their criteria ranking to each other as one large group. The consultant facilitated the group discussion and a high, medium, or low ranking was assigned to each criteria. During the large group discussion, staff proposed three additional project ranking criteria: safety, public education and public involvement, and regulatory requirements. These criteria were defined and ranked as part of the large group ranking exercise. Figures B2.2 depicts the progression of the ranking criteria beginning with the first criteria definitions and results from the workshop rankings.

Criteria - description for workshop and EC Coucil	Criteria - description for Pubic Meetings	Workshop Results	City Council EC Results	Public Meeting Aggregate Score	Parametrix Regulatory Review Results	Compiled Results
Funding: spend money where it will result in the largest overall impact	Funding: ... how willing would you be to pay a higher stormwater utility fee if it meant faster and more complete improvements to drainage, water quality, and habitat (streams & wetlands)?	H	H	H (7); M (5); L (10)	L	H
Maintenance/Inspection: improve the existing drainage pipe system	Maintenance/Inspection: ...how important is it that the City spend more time and money maintaining the existing drainage system?	H	H	H (16); M (7)	H	H
CMP Pipe Replacement	CMP Pipe Replacement: ... the City inherited thousands of feet of corrugated metal pipe that was installed by King County. This pipe is nearing the end of its useable life and many systems may fail in the near future. How important is it that the City spend more time and money to replace this failing pipe?	M/H	H	H (18); M (4); L (3)	LM	H
Ditch Removal	Ditch Replacement: ...how important is it that the City spend more time and money to replace roadside ditches that may pose safety risks by either installing pipe and filling them in or by constructing shallower swales to convey runoff?	M	M	H (12); M (9); L (2)	MH	M
Preventing Pollutants: Removing pollutants from rainwater runoff	Water Quality: ...how important is it that the City spend more time and money on removing pollutants from rainwater runoff before it is discharged into our streams and Puget Sound?	M	MH	H (13); M (5); L (2)	H	H
Geology: Addressing landslide/ground settling/seepage/erosion problems	Geology: ...how important is it that the City spend more time and money to reduce the risk of landslides, ground settling, seepage, or erosion problems?	L/M	M	H (24); M (2)	LM	M
Reduce/Eliminate Flooding	Reduce/Eliminate Flooding: ...how important is it that the City spend more time and money to reduce or eliminate flooding?	L/M	M	H (22); M (3); L (2)	M	M
Environmental: Stream enhancements/wildlife habitat/fish access improvements	Environmental: ...how important is it that the City spend more time and money to provide new wildlife habitat, habitat improvements, fish access to stream reaches, or stream enhancements?	L	M	H (6); M (2); L (10)	LM	L
LID: Use of more "natural-based" approaches to rainwater management (green stormwater infrastructure/low impact development)	LID: ...how important is it that the City focus on using a more "natural-based" approach to rainwater management (green stormwater infrastructure/low impact development)?	L	M	H (6); M (8); L (6)	H	M
Geographic: Improvements spread throughout the City/at least one project in each neighborhood and/or stream area	Geographic: ...how important is it to you that the City spend time and money to work on surface water issues evenly in each neighborhood/drainage area?	L	L	H (3); M (10); L (3)	L	L
Other Criteria (Added During Workshop): Safety	Safety: ...how important is it that the City spend more time and money to improve pedestrian or traffic safety to a level beyond what it is now?	H	H	H (9); M (6); L (5)	L	H
Other Criteria (Added During Workshop): Public Education / Public Involvement	Public Education / Public Involvement: ...how important is it that the City spend more time and money to inform the Des Moines citizens about surface water management? (Does the City need to increase public awareness? Do citizens want to get involved?)	M/H	M/H	H (3); M (10); L (4)	H	M
Other Criteria (Added During Workshop): Regulatory Requirements	Regulatory Requirements: ...how important is it that the City spend more time and money to satisfy surface water legal requirements (State surface water [NPDES] permit for cities, City ordinances, etc.)?	M	M	H (3); M (6); L (7)	H	M

RANK: High | Medium / High | Medium | Low / Medium | Low

Figure B2.2
Criteria Ranking Summary

Des Moines Surface Water
Comprehensive Plan

2.2.2 Public Involvement

At the first four public meetings, each attendee was requested to rank each criteria as high, medium, or low. Through discussion with meeting attendees the definition of the each ranking criteria evolved to include questions that people would answer in order to determine which rank to give to a criterion. Most meeting attendees elected not to participate in ranking the criteria, and those that did participate did not always rate all thirteen criteria. Many participants elected to only identify criteria that were, from their point of view, high-ranked, and criteria that were considered less than high-ranked were not evaluated. After the public meetings, the criteria ranking tallies were compiled and the aggregate ranking was evaluated and assigned for the final public meeting.

After the projects were identified and criteria ranking was completed, the projects were scored and ranked, and the results were presented at a fifth and final public meeting. Participants of the four previous meetings were invited to review and comment on the compiled results. Several adjustments to the project scoring resulted from this meeting. Discussion regarding project scoring is provided in Section 3 below. Figure B2.2 depicts the combined workshop results and modified criteria wording.

2.2.3 City Council Involvement

As previously mentioned, the Environment Committee was presented with opportunity for input on two occasions; first after the data gathering and workshop with the City staff, and second after the first four public meetings and consultant review of the ranking criteria from a regulatory perspective. At the first Environment Committee meeting, committee members rated each criterion individually, and then discussed each ranking criteria as a group before finalizing an agreed rank for each criteria. At the second meeting, the Environment Committee was presented with the compiled public meeting results and comments and with the results from the regulatory perspective review. As a result of the meeting, the Environment Committee elected to change the rank of the water quality criteria from Medium to Medium/High. This decision was made because it better reflects the public opinion and the regulatory review regarding water quality. Figure B2.2 depicts the City Council Environment Committee results.

2.2.4 Regulatory Review

The consultant reviewed the project ranking criteria from a regulatory perspective. The purpose of this was to identify which criteria may increase or decrease the importance of a project depending on how it would impact the City's compliance with the National Pollutant Discharge Elimination System (NPDES) Phase II Municipal Stormwater Permit. Five criteria stood out as having a significantly different ranking as compared to the perspectives of the other groups. Those criteria were funding, CMP pipe replacement, low impact development (LID), safety, and regulatory requirements.

Regarding funding, from the regulatory perspective it is a low priority to determine where the funds come from if the project is necessary for the proper function of stormwater infrastructure or the protection of water quality or habitat.

Regarding CMP pipe replacement, the independent regulatory review ranked this criterion low/medium while the public, City Staff, and Environment Committee ranked this criterion high or medium/high. The NPDES Phase II Municipal Stormwater Permit regulations require the City to inspect, inventory, and keep records of the storm drain systems, but these regulations do not require City's to replace drainage structures prior to failure. The City of Des Moines Municipal Code requires that stormwater facilities be maintained so that they operate as intended, and that systematic, routine preventative maintenance is preferred (DMMC 11.20.080(2)(a). The City prefers to maintain a level of service that replaces drainage pipes and drainage structures prior to failure. Therefore, this criterion is ranked high with intent of meeting the City Code and indicating that the City is intent of providing a pro-active level of service with respect to the City's stormwater infrastructure.

Regarding LID, it is not a project category or criteria of itself, but rather an approach to be applied to projects as applicable. However, the Washington Department of Ecology 2012 Stormwater Management Manual for Western Washington (2012 SWMMWW) requires LID to be considered as the primary design approach unless it can be demonstrated that LID is not feasible for a project. Therefore, although the City has not yet adopted the 2012 SWMMWW or an equivalent manual, LID is a design approach that City projects will need to comply with when in the future.

Regarding safety, it is not a project category or criteria of itself, but instead is a byproduct of a project that reduces or eliminates flooding. Therefore, safety is considered a low regulatory priority.

Regarding regulatory requirements, this is not a project category or criteria of itself, but is required to satisfy surface water legal requirements of the NPDES Phase II Municipal Stormwater Permit. Thus, regulatory requirements are considered high priority.

Figure B2.2 depicts the results from the consultant's review using a regulatory perspective.

3 Results

3.1 Ranking Criteria

Upon completion of the criteria ranking from the perspectives described in the previous section the consultant compiled the results to provide the final criteria ranking (see Figure B2.2).

With the ranks established, the consultant prepared a convention to score the criterion. Although ranks of Low/Medium and Medium/High were given to criteria, it was determined that only high, medium and low would be established as ranking criteria levels. To create separation of values and emphasize the difference between the three levels, high was scored at six points, medium was scored at four points, and low was scored at two points. Once the initial convention was established, projects were scored and ordered from highest to lowest total points. A range of points was then selected to identify high-, medium-, and low-ranked projects. These results were presented to the elected officials at the second Environment Committee meeting, and separately to the local residents at the fifth public meeting. Discussion and feedback allowed the consultant to further refine the scoring of the thirteen criteria. It became apparent that criteria, such as preventing pollutants, geology, CMP replacement, or Public Involvement, had opportunity for projects to receive partial credit. Therefore, a revised scoring key was created to include multipliers of 0, 1 or 2 depending on criteria application. Figure B3.1 presents the final score card which depicts the scores of the entire capital project list. Figure B3.2 presents the score key with was developed as reference and provide basis of scoring decision making when evaluating a capital project.

The revised scoring key does not change the importance of individual criteria, but rather provides clarity in the definition of each criterion and how it should be applied to a project. Generally speaking, a 0 multiplier is used for criteria that do not apply to a project, a 1 multiplier is used when there are project elements that have limited or peripheral application, and a 2 multiplier is used when criteria fully apply.

For each criterion, the applicable multipliers are as follows:

Funding:

0 Projects that have no funding identified.

1 Projects that may be eligible for grants or funds outside of the City SWM funds.

2 Projects that have funding secured, including City SWM funds or grants.

Maintenance and Inspection:

0 Projects that would increase maintenance activity. This applies to projects that install new stormwater pipe and catch basins to City streets that not currently do not have stormwater infrastructure, therefore installing new infrastructure would add to the maintenance required on the system.

1 Projects that have no net change to maintenance. Examples of this are projects where an existing storm system of pipes and catch basins is being replaced in kind, or if an existing ditch which requires maintenance is being replaced by storm drain pipes and catch basins that will need to be maintained.

2 Projects that reduce maintenance activity. This type of project is most valuable to the City because it would reduce annual maintenance activity and cost, therefore it would receive the highest point total for this criterion. No listed projects reduce maintenance.

Safety:

0 Projects that do not include safety improvements.

1 Multiplier not used. This criterion does not have a partial element.

2 Projects that include safety improvements.

CMP Pipe Replacement:

0 Projects that do install or replace storm pipe.

1 Projects that add new storm drain pipe where existing enclosed drainage does not exist. The addition of this mid-range definition stemmed from the fact that projects that were resolving drainage issues by installing a formal drainage system were not receiving points from any project criteria, except for Reduce or Eliminate Flooding when applicable. These projects are important, but no criteria existed to rate them, so rather than adding a new criterion, this definition was created within the CMP Pipe Replacement criterion.

2 Projects that replace existing storm pipe.

Public Education / Public Involvement

0 Projects that do not include public education or public involvement element

1 Projects provide public education opportunities, such as signage that would inform residents of the important, function, or improvement of the drainage project.

2 Projects that were created as a result of public comments.

Capital Project	Project Title	Funding		Maintenance / Inspection		Safety		CMP Pipe Replacement		Public Education / Public Involvement		Ditch Removal		Preventing Pollutants		Regulatory Requirements		Geology		Reduce / Elliminate Flooding		Environmental		Low Impact Development (LID)		Geographic		TOTAL PROJECT SCORE
		H		H		H		H		M		M		H		M		M		M		L		M		L		
		Multiplier	Value	Multiplier	Value	Multiplier	Value	Multiplier	Value	Multiplier	Value	Multiplier	Value	Multiplier	Value	Multiplier	Value	Multiplier	Value	Multiplier	Value	Multiplier	Value	Multiplier	Value	Multiplier	Value	
PUBLIC MEETING FOCUS AREA A																												
6	199th North Hill Trunkline Upgrade		0	1	6		0	2	12		0		0		0		0		0	2	8		0		0		0	**26**
7	1st Avenue Pond Expansion	2	12		0		0		0		0		0	2	12		0		0	2	8	1	2		0		0	**34**
8	North Hill NE and 197th Street Trunkline Upgrade		0	1	6		0	2	12		0		0		0		0		0	2	8		0		0		0	**26**
10	1st Place South (197th to 192nd)		0		0		0	1	6		0		0		0		0		0	2	8		0		0		0	**14**
12	1st Place South (201st to 204th) Pipe Upgrade		0		0		0	2	12		0		0		0		0		0	2	8		0		0		0	**20**
13	3rd Avenue (206th to 207th) Pipe Project		0		0		0	1	6		0		0		0		0		0	1	4		0		0		0	**10**
14	1st Place South (209th to 210th) Pipe Project		0	1	6		0	1	6	2	8	2	8		0		0		0	2	8		0		0		0	**36**
15	3rd Avenue South (213th to 216th) Pipe Project		0		0		0	1	6	2	8	2	8		0		0		0	2	8		0		0		0	**30**
16	5th Avenue South/212th Street Pipe Upgrade		0	1	6	2	12	2	12	2	8	2	8	1	6		0	2	8	2	8		0		0		0	**68**
17	216th Place/Marine View Drive Pipe Upgrade	1	6	1	6	2	12	2	12		0	1	4	1	6		0		0	2	8		0		0		0	**54**
18	Des Moines Memorial Drive - S. 208th to S. 212th Pipe Project		0	1	6	2	12	1	6		0	2	8		0		0	2	8	2	8		0		0		0	**48**
19	14th Avenue/15th Avenue N/O 215th Place Pipe Project		0		0		0	1	6		0		0		0		0		0	2	8		0		0		0	**14**
20	222nd/223rd 8th Avenue to 11th Avenue Pipe Project		0		0		0	1	6		0	1	4		0		0		0	2	8		0		0		0	**18**
22	220th Street (15th Ave to SJU Park) Pipe Replacement Project		0	1	6		0	2	12		0	1	4		0		0		0	0	0		0		0		0	**22**
38	9th Avenue (202nd to 206th) Pipe Project		0	1	6		0	1	6	2	8	1	4		0		0		0	2	8		0		0		0	**32**
PUBLIC MEETING FOCUS AREA B																												
3	Lower Massey Creek Channel Modifications	2	12	1	6	2	12		0	2	8		0	1	6		0	2	8	2	8	2	4		0		0	**64**
4	Barnes Creek/Kent Des Moines Road Culvert Replacement	2	12	1	6		0	2	12	2	8		0		0		0	2	8	2	8	2	4		0		0	**58**
5	24th Avenue Pipeline Replacement	2	12	1	6		0	2	12	2	8		0		0		0		0	2	8		0		0		0	**46**
21	223rd Street (13th Avenue to 19th Avenue) Pipe Project		0	1	6		0	1	6		0	1	4		0		0		0		0		0		0		0	**16**
23	24th Avenue (223rd to 224th) Pipe Upgrade		0	1	6		0	2	12	2	8	2	8		0		0		0	2	8		0		0		0	**42**
24	16th Avenue (224th to 228th) Pipe Project		0		0		0	1	6		0		0		0		0		0	2	8		0		0		0	**14**
25A	KDM/16th Avenue Pipe Replacement Project		0	1	6		0	2	12	2	8	1	4	1	6		0	2	8	2	8		0		0		0	**52**
25B	KDM/16th Avenue (228th to KDM Rd) Pipe Project		0	1	6		0	1	6	2	8	1	4	1	6		0	2	8	2	8		0		0		0	**46**
26	232nd Street (10th to 14th) Pipe Project		0		0		0	1	6	2	8	2	8	1	6		0	2	8	2	8		0		0		0	**44**
28	240th Street (13th to 16th Ave) Pipe Project		0	1	6		0	1	6		0	1	4		0		0		0		0		0		0		0	**16**
29	25th Avenue (n/o 232nd Street) Pipe Replacement Project		0	1	6		0	1	6		0	1	4		0		0		0		0		0		0		0	**16**
PUBLIC MEETING FOCUS AREA C																												
11	Saltwater Highlands Tract A pond replacement		0	1	6		0		0		0	0	0	2	12	0	0	1	4	0	0	1	2		0		0	**24**
27	240th Street (MVD to 11th Place) Pipe Project		0	1	6		0	1	6		0	1	4		0		0		0	2	8		0		0		0	**24**
30	North Fork McSorley Creek Diversion Project	2	12	1	6	2	12	1	6	2	8		0	1	6		0		0	2	8	1	2		0		0	**60**
31	20th Avenue/243rd Street Pipe Upgrade		0	1	6		0	2	12		0	1	4		0		0		0	2	8		0		0		0	**30**
32	242nd Street (26th Ave to 26th Pl) Pipe Project		0	1	6		0	2	12	2	8		0		0		0		0		0		0		0		0	**26**
33	252nd Street/9th Avenue Pipe Project		0		0		0	1	6	2	8		0		0		0		0	2	8		0		0		0	**22**
34	258th Street (13th Pl to 16th Ave) Pipe Project		0	1	6		0	1	6	2	8	2	8	1	6		0		0	2	8		0		0		0	**42**
35	22nd Avenue Outfall Project		0		0		0	1	6		0	2	8	1	6		0		0	2	8		0		0		0	**28**
39	6th Avenue/239th St. Pipe Replacement	1	6	1	6	2	12	2	12	2	8		0		0		0	1	4	2	8		0		0		0	**56**
PUBLIC MEETING FOCUS AREA D																												
36	14th Avenue (268th to 272nd) Pipe Upgrade	1	6	1	6		0	1	6	2	8	1	4	1	6		0	2	8	2	8	2	4		0		0	**56**
37	6th Place/287th Street Pipe Replacement Project		0		0	2	12	2	12	2	8		0		0		0		0	2	8		0		0		0	**40**
40	8th Avenue (264th to 265th) Pipe Project	1	6		0	2	12	1	6	2	8		0		0		0	2	8	2	8		0		0		0	**48**
41	12th/13th Avenue (270th to 272nd Street)		0		0		0	1	6	2	8		0		0		0		0	2	8		0		0		0	**22**
CITYWIDE																												
9	Pipe Replacement Program (unidentified projects)		0	1	6	2	12	2	12		0		0		0	1	4		0		0		0		0		0	**34**

Color	Rank	Rank Weight
	High	6
	Medium	4
	Low	2

Total Possible Points: 116

Figure B3.1
Capital Project Score Card

Des Moines Surface Water
Comprehensive Plan

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Ranking Criteria	Multiplier	Multiplier Description
Funding	0	= No outside funding identified
	1	= Grant funding may be available
	2	= Grant funding secured, or City funds already allotted for capital project
Maintenance/ Inspection Existing Pipe System	0	= Increase maintenance activity
	1	= No net change in maintenance activity
	2	= Reduce maintenance activity
Safety	0	= No apparent safety improvement
	1	= Score not used
	2	= Safety improvement
CMP Pipe Replacement	0	= No pipe replacement
	1	= Add new pipe where existing enclosed conveyance does not exist
	2	= Replaces existing pipe
Public Education / Public Involvement	0	= No public education/involvement element
	1	= Provides public education (e.g. signage)
	2	= Result of public input
Ditch Removal	0	= Not ditch project
	1	= Ditch removal, result is no improvement to water quality
	2	= Ditch removal, result is water quality improvementt
Preventing Pollutants	0	= No change to water quality
	1	= project results in a water quality improvement
	2	= Targeted water quality project
Regulatory Requirements	0	= No regulatory requirement element
	1	= Results achieved in NPDES permit (project would be listed in Annual Report)
	2	= Meets requirement not currently met
Geology	0	= No effect to geology
	1	= Score not used
	2	= Addresses geologic hazards
Reduce / Eliminate Flooding	0	= No flood control element
	1	= Score not used
	2	= Addresses flooding problem
Environmental	0	= No change to environmentally sensitive areas
	1	= Environmental benefit
	2	= Environmental specific project
Low Impact Development (LID)	0	= No LID element
	1	= Has LID components
	2	= Project has LID focus
Geographic	0	= Does not meet the geographic rule
	1	= Score not used
	2	= Meets the geographic standard

Color	Rank	Rank Weight
	High	6
	Medium	4
	Low	2

Figure B3.2
Scoring Key

Des Moines Surface Water
Comprehensive Plan

Ditch Removal

0 Projects that do not involve ditch removal.

1 Projects that remove a ditch and the removal creates a negative impact to water quality because the ditch was removing pollutants by slowing down runoff rates and increasing sediment deposition in the ditch.

2 Projects that remove a ditch and the ditch removal has a either a positive impact or no impact on water quality.

Preventing Pollutants

0 Projects that do not improve water quality.

1 Projects that provide water quality as an incidental result of the project, but the project is does not have a water quality focus. This would apply to a project that may remove a ditch because of the steep slopes that cause erosion and sediment load problems in the receiving water. The project may not install a water quality treatment facility, but it does provide water quality by reducing erosion and sedimentation at the receiving water.

2 Projects that are water quality specific projects such as installing or expanding a water quality treatment facility.

Regulatory Requirements

0 Projects that have no relevance to regulatory requirements.

1 Projects that would be mentioned in the Annual Report for the City's Surface Water Management Program, but do not result in achieving an NPDES Phase II Permit requirement that was not currently met.

2 Projects that would result in achieving an NPDES Phase II Permit requirement that was not currently met.

No projects in the capital projects list developed for the SWCP received a score for this criterion.

Geology

0 Projects that do not have geologic improvements.

1 Multiplier not used. This criterion does not have a partial element.

2 Projects that will improve a geologic hazard, such as reduce or remove erosion or landslide hazard.

Reduce or Eliminate Flooding

0 Projects that do not address a flooding problem.

1 Multiplier not used. This criterion does not have a partial element.

2 Projects that address a flooding problem.

Environmental

0 Projects that do not have environmental benefits receive zero points for this criterion.

1 Projects that provide an environmental benefit as a secondary result of the project, but the project is does not have an environmental habitat focus.

2 Projects that have are targeted for environmental improvements, such as a stream restoration project or a fish passage culvert installation.

Low Impact Development (LID)

0 Projects that do not have LID elements receive zero points for this criterion.

1 Projects that include LID as an element of the drainage project.

2 Projects that are LID specific such as stormwater retrofit with LID design focus.

Geography

0 Projects that do not meet the geography rule.

1 Multiplier not used. This criterion does not have a partial element.

2 Projects that meet the geographic rule.

Geography is a criterion that places importance on how many projects are being constructed in one drainage basin or geographic region within the City compared to another. This criterion received an overall low ranking and therefore, no a precedence or standards was not established for this criterion. No projects in the capital projects list developed for this SWCP received a score for the geographic criterion.

This ranking system allows the City to objectively compare multiple projects to each other and ultimately determine which project should be funded for design and construction. This tool will continue to be useful for the City in the future as the CIP evolves and new drainage, water quality or habitat projects are identified.

3.2 Identified Projects

As previously discussed, projects were identified by City staff and through residents' input by way of either the public meetings other public comment forms.

Projects were numbered 1 through 41 beginning with projects that were already identified in the City's 2014-2019 SWM CIP. These capital projects were numbered 1 through 9. Capital Projects 10 through 37 were provided by the City staff. As a result of public comments, Capital Project 25 was separated into two projects, 25A and 25B, Capital Projects 38, 39, 40, and 41 were created, and Capital Projects 4 and 15 were further identified as projects with high public interest. Finally, Capital Project 1 - Des Moines Memorial Drive - S. 212th to S. 213th Pipeline Replacement and Capital Project 2 - 216th Place Culvert Replacement were removed from the list because they have already been constructed. Capital Project 3 – Lower Massey Creek Channel Modification is in the SWM CIP budget to be constructed in 2015, but since that will not occur until after this SWCP will be completed, that project remains on the capital project list. Projects were not renumbered, for continuity of the report and discussion with the residents who became familiar with the project numbers.

Project identification is important for developing a list of needs, and project ranking is important to determine which projects are most important to the City and its staff according to the scoring system. Similarly as important is an estimated project cost for each capital project. The consultant used project sketches provided by City staff to develop project descriptions and cost estimates for all 39 capital projects. The assumptions for each capital project are provided with the cost estimate. A map depicting each capital project location and rank is found in Section 4 of the SWCP. Individual capital project maps depicting project descriptions and cost estimates are provided in Appendix C.

A summary of the 39 capital projects arranged by score and separated by rank and cost is provided in Figure B3.3. There are 19 high-ranked projects, 12 medium-ranked projects, and 9 low-ranked projects. The project score ranges that were selected to represent the high-, medium-, and low-ranked projects are as follows:

- 0-20: Low
- 22-34: Medium
- 34 and above: High

The medium range is relatively narrow, when compared to the low and high ranges; however, this narrow range was set for this SWCP because of the large number of projects that have been identified. Thus, the score of 34 was set as the low score threshold for the high rank projects because it is the mid-point of the project scores and will set up the City to complete half of the capital projects identified in this SWCP in a 10 year CIP.

Funding of capital projects was evaluated through three scenarios, which vary according to the rate at which future projects will be funded (in order of priority) and the operating program additions made. The capital project elements included in the scenarios are:

- Scenario 1: Fund 14 high-ranked capital projects by the end of the planning period (2015-2024) while maintaining the City's current rate increase structure. The 14 projects included in Scenario 1 are presented as the un-shaded high-ranked projects in Figure B3.3.
- Scenario 2: Fund all 19 high-ranked projects by the end of 2024 with a surface water rate increase. The five additional, high-ranked projects included in Scenario 2 are presented as the grey, shaded high-ranked projects in Figure B3.3.
- Scenario 3: Fund all high-ranked (19) and medium ranked (12) projects by the end of 2024 with a larger surface water rate increase.

Scenario 1 includes Capital Project 7 and Capital Project 9, even though these projects have the lowest scores (34) of all high-ranked projects (Figure B3.3). Capital Project 7, the 1st Avenue Pond Expansion, has already been adopted in the current CIP and the City anticipates an inter-local agreement with the City of Normandy Park to provide funds to support this project. Capital Project 9, Pipe Replacement Program, will use allocated Capital Funds to replace degraded pipes as needed. This program will work in conjunction with the closed circuit television (CCTV) video assessment of the City's existing storm sewer system that is also being proposed as a funded element of Scenario 1. Therefore, although the program is not a standalone capital project, the capital funds will be used annually to improve the City's aged storm sewer infrastructure.

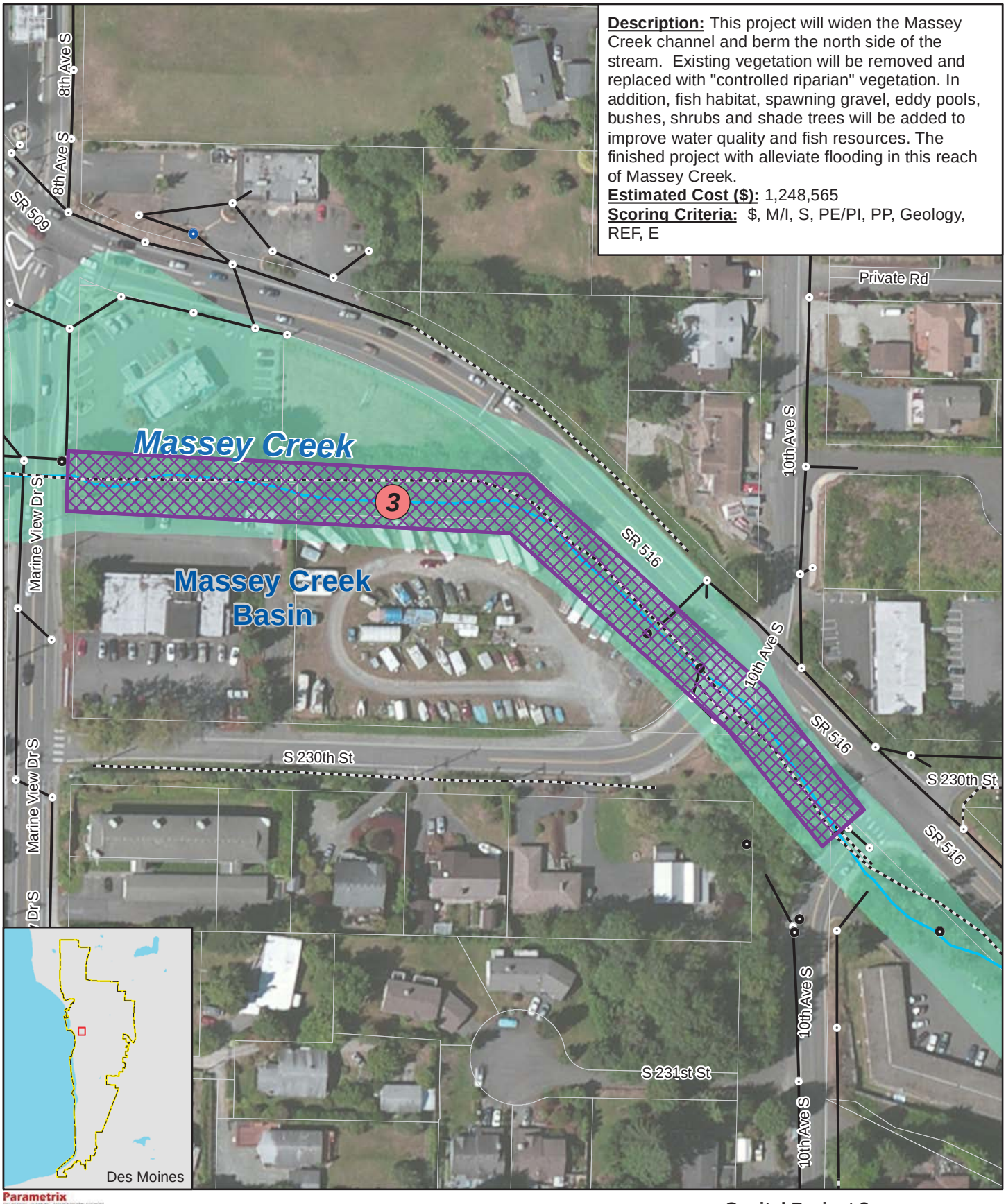
For further discussion regarding the funding scenarios in and the fiscal analysis, see Appendix E.

Capital Project	Public Meeting Focus Area	Project Title	Estimated Cost	Score
High-Ranked Projects				
16	**A**	5th Avenue South/212th Street Pipe Upgrade	$724,220	**68**
3	**B**	Lower Massey Creek Channel Modifications	$1,248,565	**64**
30	**C**	North Fork McSorley Creek Diversion Project	$372,960	**60**
4	**B**	Barnes Creek/Kent Des Moines Road Culvert Replacement	$1,470,081	**58**
39	**C**	6th Avenue/239th St. Pipe Replacement	$164,220	**56**
36	**D**	14th Avenue (268th to 272nd) Pipe Upgrade	$411,740	**56**
17	**A**	216th Place/Marine View Drive Pipe Upgrade	$258,300	**54**
25A	**B**	KDM/16th Avenue Pipe Replacement Project	$227,080	**52**
18	**A**	Des Moines Memorial Drive - S. 208th to S. 212th Pipe Project	$504,980	**48**
40	**D**	8th Avenue (264th to 265th) Pipe Project	$219,800	**48**
5	**B**	24th Avenue Pipeline Replacement	$260,100	**46**
25B	**B**	KDM/16th Avenue (228th to KDM Rd) Pipe Project	$714,420	**46**
7	**A**	1st Avenue Pond Expansion	$334,672	34
9	**ALL**	Pipe Replacement Program (unidentified projects)	$1,474,667	34
		Sub-Total Estimated Cost of High-Ranked Projects	$8,385,805	
26	**C**	232nd Street (10th to 14th) Pipe Project	$496,580	44
23	**B**	24th Avenue (223rd to 224th) Pipe Upgrade	$226,100	42
34	**C**	258th Street (13th Pl to 16th Ave) Pipe Project	$341,600	42
37	**D**	6th Place/287th Street Pipe Replacement Project	$496,300	40
14	**A**	1st Place South (209th to 210th) Pipe Project	$211,260	36
		Sub-Total Estimated Cost of High-Ranked Projects	$1,771,840	
		Grand Total Estimated Cost of High-Ranked Projects	**$10,157,645**	
Medium-Ranked Projects				
38	**A**	9th Avenue (202nd to 206th) Pipe Project	$185,920	32
15	**A**	3rd Avenue South (213th to 216th) Pipe Project	$322,140	30
31	**C**	20th Avenue/243rd Street Pipe Upgrade	$371,840	30
35	**C**	22nd Avenue Outfall Project	$191,380	28
6	**A**	199th North Hill Trunkline Upgrade	$231,395	26
8	**A**	North Hill NE and 197th Street Trunkline Upgrade	$482,857	26
32	**C**	242nd Street (26th Ave to 26th Pl) Pipe Project	$100,100	26
11	**C**	Saltwater Highlands Tract A pond replacement (and/or stabilize adjacent rav	$360,962	24
27	**C**	240th Street (MVD to 11th Place) Pipe Project	$343,840	24
22	**A**	220th Street (15th Ave to SJU Park) Pipe Replacement Project	$335,860	22
33	**C**	252nd Street/9th Avenue Pipe Project	$191,240	22
41	**D**	12th/13th Avenue (270th to 272nd Street)	$496,020	22
		Total Estimated Cost of Medium-Ranked Projects	**$3,613,554**	
Low-Ranked Projects				
12	**A**	1st Place South (201st to 204th) Pipe Upgrade	$415,100	20
20	**A**	222nd/223rd 8th Avenue to 11th Avenue Pipe Project	$472,220	18
21	**B**	223rd Street (13th Avenue to 19th Avenue) Pipe Project	$292,880	16
28	**B**	240th Street (13th to 16th Ave) Pipe Project	$248,080	16
29	**B**	25th Avenue (n/o 232nd Street) Pipe Replacement Project	$99,680	16
10	**A**	1st Place South (197th to 192nd)	$237,860	14
19	**A**	14th Avenue/15th Avenue N/O 215th Place Pipe Project	$110,600	14
24	**B**	16th Avenue (224th to 228th) Pipe Project	$331,240	14
13	**A**	3rd Avenue (206th to 207th) Pipe Project	$165,060	10
		Total Estimated Cost of Low-Ranked Projects	**$2,372,720**	

Figure B3.3
Capital Project Cost, Priority, and Scoring Summary

Appendix C

Capital Project Sheets



Parametrix

N

0 50 100

Feet

- Discharge Point
- Control Structure
- Catchment
- WQ Facility
- Open Channel
- Storm Main

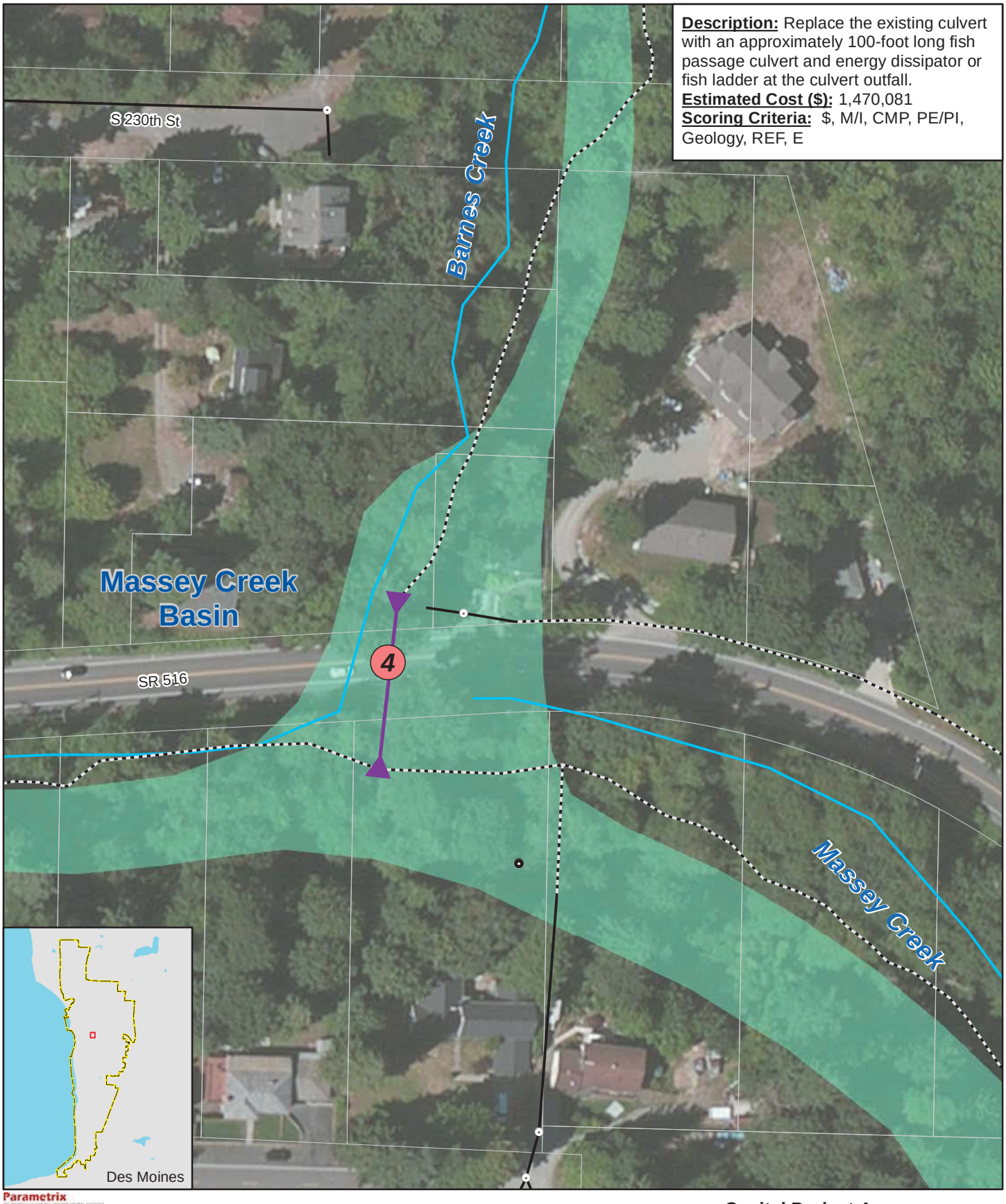
Capital Project and Rank

- High
- Medium
- Low
- Proposed Stream Improvement
- Proposed Catch Basin

- Streams
- 100 Year Flood
- Drainage Basin
- City Limits

Capital Project 3.
Lower Massey Creek Channel Modifications

City of Des Moines
Surface Water Comprehensive Plan



Description: Replace the existing culvert with an approximately 100-foot long fish passage culvert and energy dissipator or fish ladder at the culvert outfall.
Estimated Cost ($): 1,470,081
Scoring Criteria: $, M/I, CMP, PE/PI, Geology, REF, E

Parametrix

N

0 40 80

Feet

- Discharge Point
- Control Structure
- Catchment
- WQ Facility
- Open Channel
- Storm Main

Capital Project and Rank

- High
- Medium
- Low
- Proposed Culvert
- Proposed Catch Basin

- Streams
- 100 Year Flood
- Drainage Basin
- City Limits

Capital Project 4.
Barnes Creek/Kent Des Moines Road Culvert Replacement

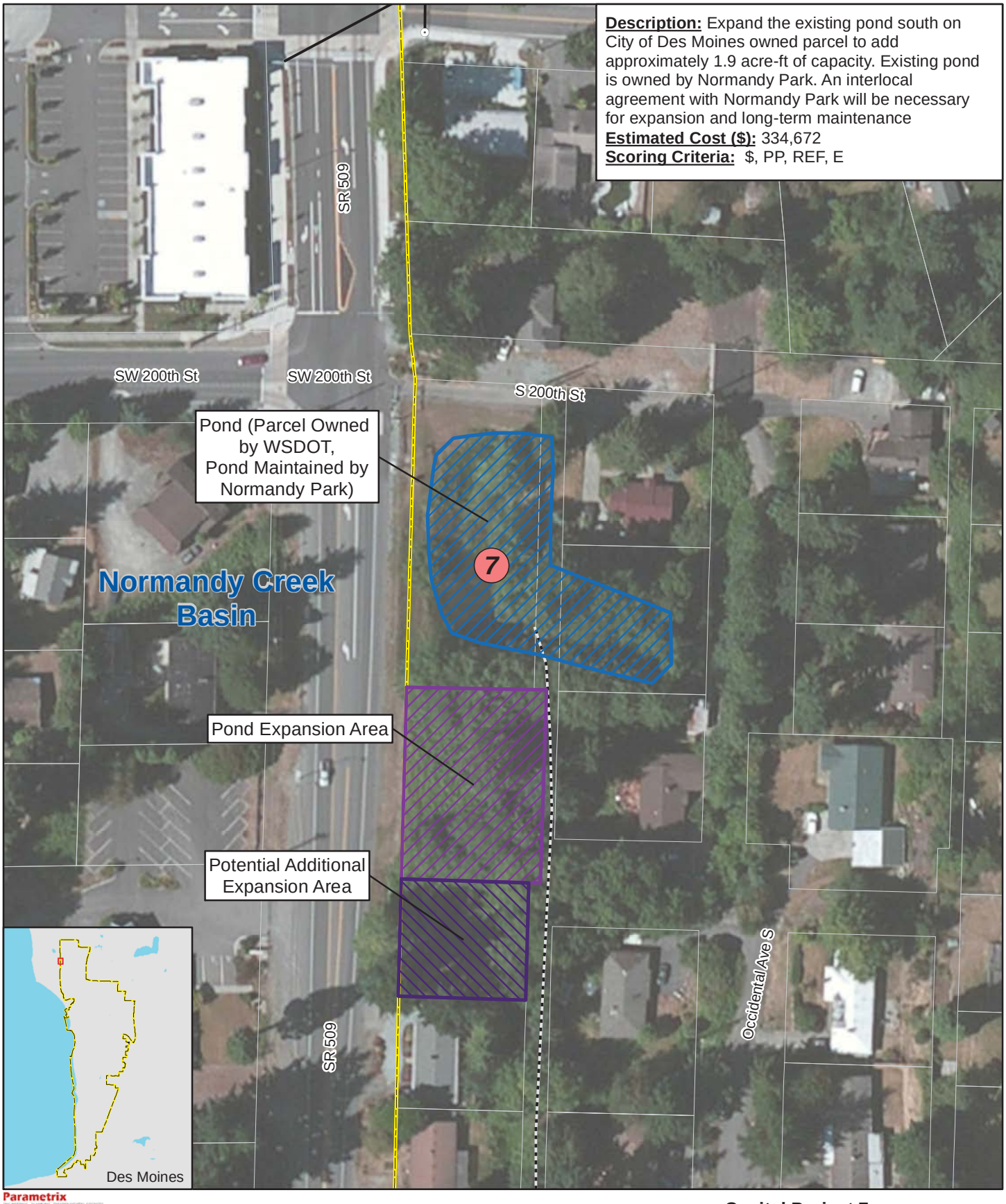
City of Des Moines
Surface Water Comprehensive Plan

Capital Project 5.
24th Avenue Pipeline Replacement

City of Des Moines
Surface Water Comprehensive Plan

Capital Project 6.
199th North Hill Trunkline Upgrade

City of Des Moines
Surface Water Comprehensive Plan



Parametrix

N

0 40 80

Feet

- Discharge Point
- Control Structure
- Catchment
- WQ Facility
- Open Channel
- Storm Main

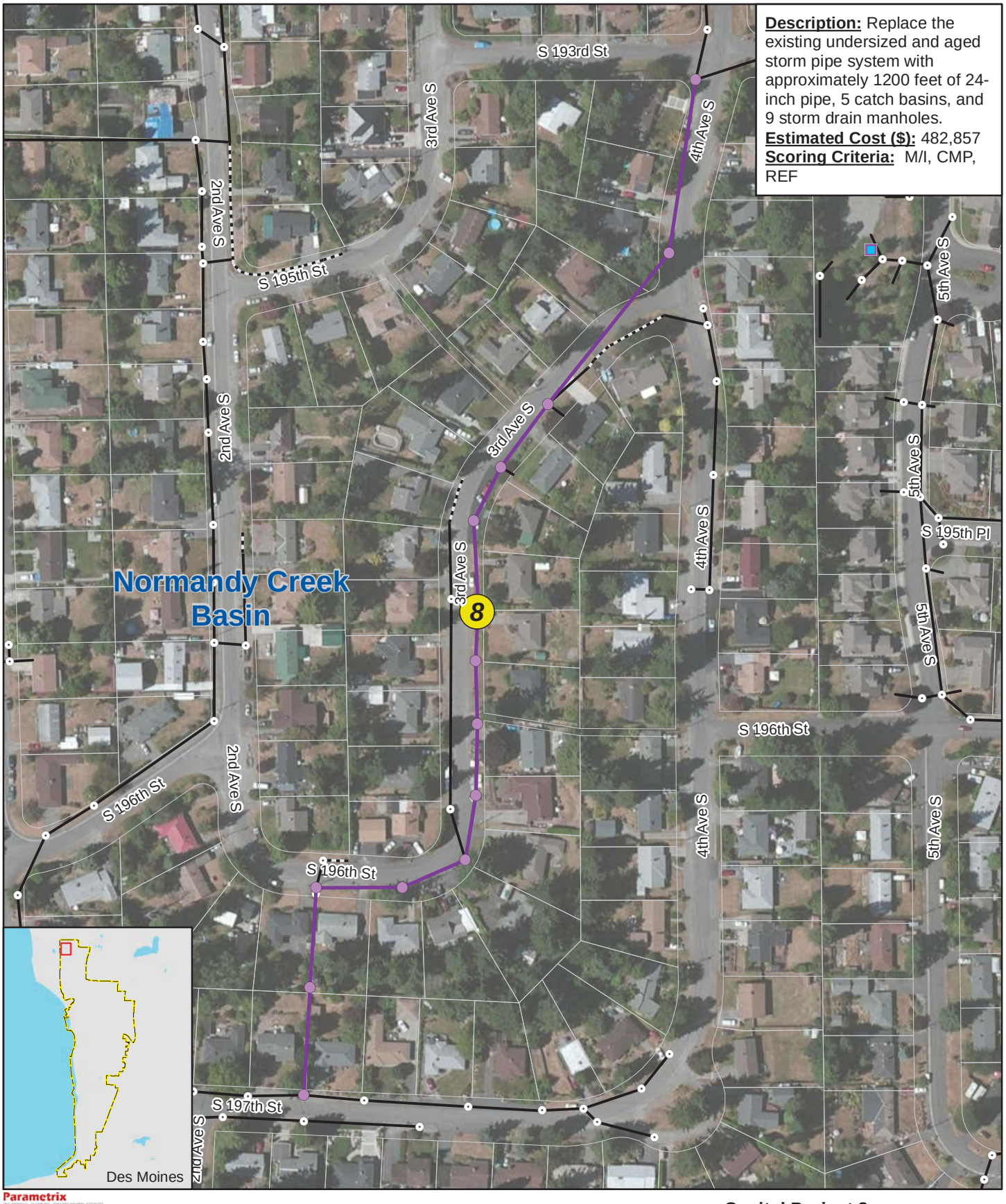
Capital Project and Rank

- High
- Medium
- Low
- Existing Pond Area
- Proposed Pond Expansion
- Potential Expansion Area
- Proposed Catch Basin

- Streams
- 100 Year Flood
- Drainage Basin
- City Limits

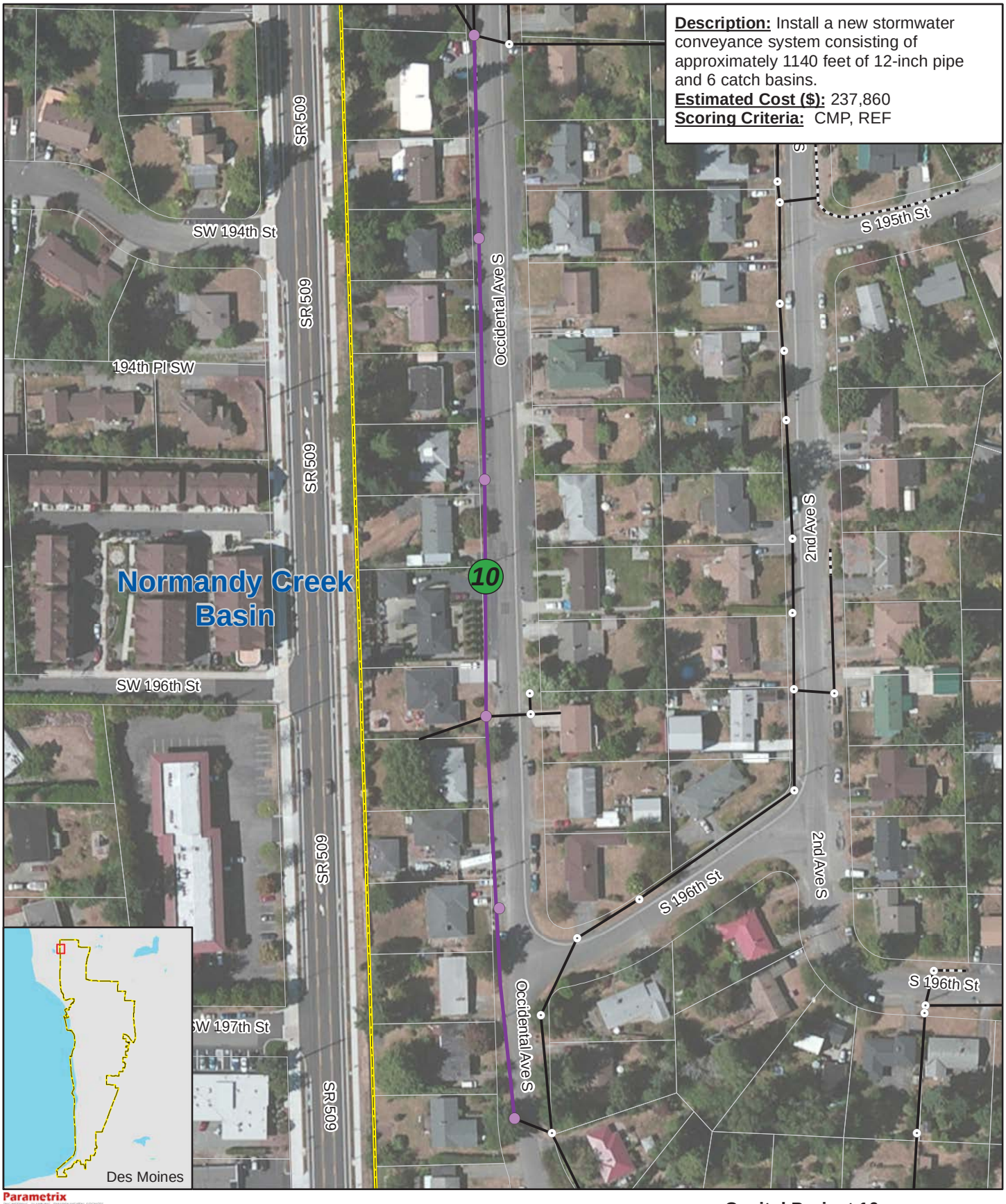
Capital Project 7.
1st Avenue Pond Expansion

City of Des Moines
Surface Water Comprehensive Plan



Capital Project 8.
North Hill NE and 197th Street Trunkline Upgrade

City of Des Moines
Surface Water Comprehensive Plan



Parametrix

N

0 60 120

Feet

- Discharge Point
- Control Structure
- Catchment
- WQ Facility
- Open Channel
- Storm Main

Capital Project and Rank

- High
- Medium
- Low
- Proposed Drain Pipe
- Proposed Catch Basin

- Streams
- 100 Year Flood
- Drainage Basin
- City Limits

Capital Project 10.
1st Place South (197th to 192nd)

City of Des Moines
Surface Water Comprehensive Plan

CITY OF DES MOINES
2015 Comprehensive Stormwater Plan Update
Preliminary Opinion of Probable Cost

Capital Project 10
Project Name: 1st Place South (197th to 192nd)
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:
New 12" SD system and curb along W side of 1st Pl S. Connect SD system to existing SD system in front of house number 19367, and to CB in front of house number 19613. Install 2-foot wide pavement beyond the existing W edge of pavement for approximately 465 LF.

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	$10,700	$10,700
2	1	LS	Traffic Control	$2,100	$2,100
3	1	LS	Erosion/Sedimentation Control	$2,100	$2,100
4	1140	LF	Pavement Restoration	$20	$22,800
5	1140	LF	Schedule A Storm Sewer Pipe, 12-Inch Diameter	$60	$68,400
6	6	EA	Catch Basin Type I	$1,930	$11,580
7					
8					
9					
10					

Construction Subtotal (2014 Dollars) =		$117,680
Inflation from 2014 to 2015	3.65%	$4,295
Construction Subtotal (2015 Dollars) =		**$121,975**
Contingency	30.0%	$36,593
Sales Tax	9.3%	$11,344
Planning Level Construction Cost =		**$169,900**
Environmental Permitting and Documentation	5.0%	$8,495
Administration	5.0%	$8,495
Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	$50,970
2015 TOTAL =		**$237,860**

ASSUMPTIONS:
Length of pipe, pipe diameter, number of structures and structure size were provided by City of Des Moines.
Mobilization equals approximately 10-percent of Subtotal.
Traffic Control equals approximately 2-percent of Subtotal.
Erosion/Sedimentation Control equals approximately 2-percent of Subtotal ($1,000 min).
Pavement Restoration includes the cost of HMA (2-inch), CSTC (2-inch), and CSBC (4-inch).
Cost of pipe installation includes structure excavation and shoring.
Cost of catch basin installation includes structure excavation and shoring.

ravine bank)

Parametrix

N

0 30 60

Feet

- Discharge Point
- Control Structure
- Catchment
- WQ Facility
- Open Channel
- Storm Main

Capital Project and Rank

- High
- Medium
- Low
- Proposed Pond Replacement
- Proposed Catch Basin

- Streams
- 100 Year Flood
- Drainage Basin
- City Limits

Capital Project 11.
Saltwater Highlands Tract A pond replacement (and/or stabilize adjacent ravine bank)

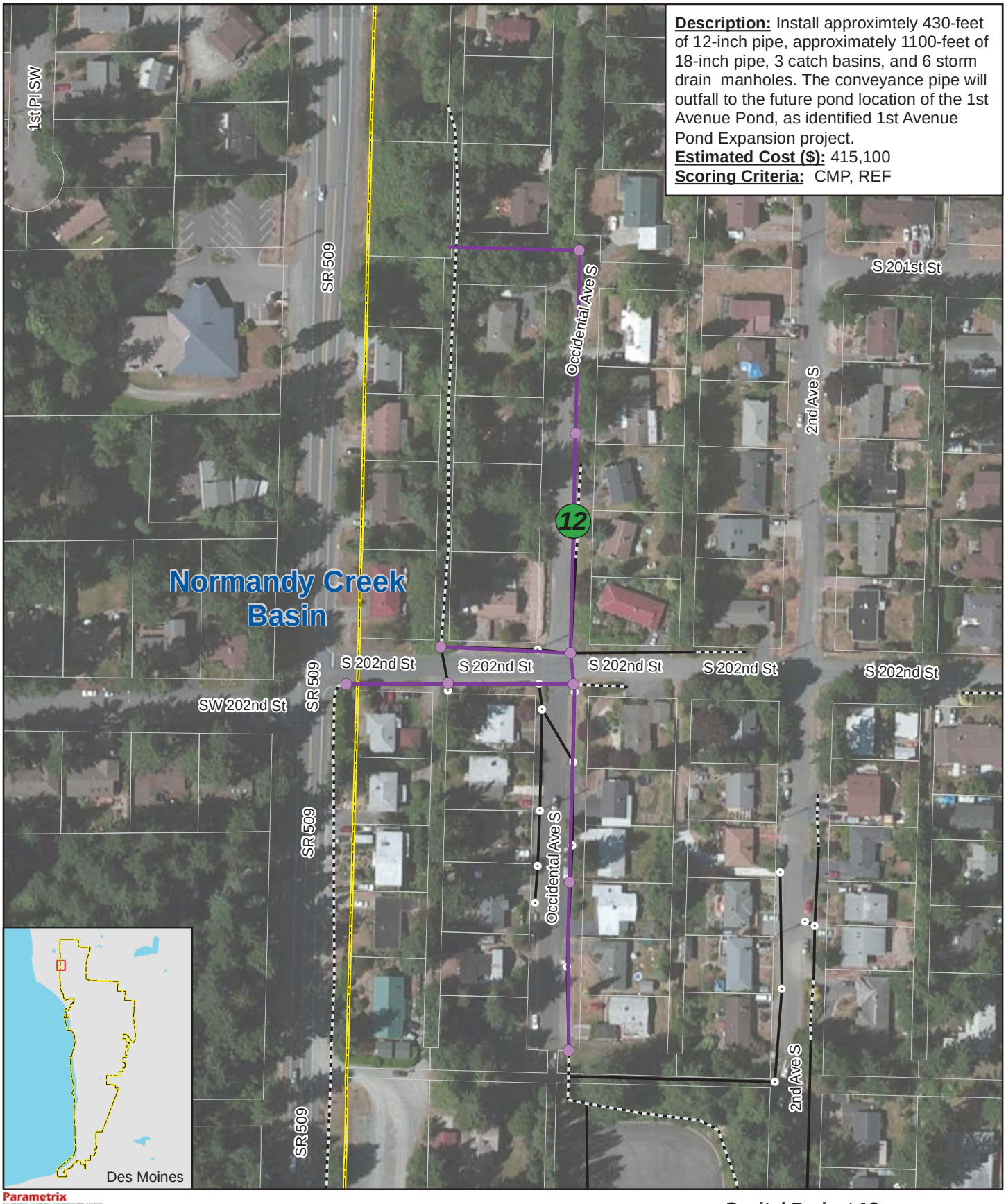
City of Des Moines
Surface Water Comprehensive Plan

CITY OF DES MOINES
2015 Comprehensive Stormwater Plan Update
Preliminary Opinion of Probable Cost

Capital Project 11
Project Name: Saltwater Highlands Tract A pond replacement (and/or stabilize adjacent ravine bank)
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
			Construction Subtotal (2014 Dollars) =		$250,000
			Inflation from 2014 to 2015	3.65%	$9,125
			Construction Subtotal (2015 Dollars) =		**$259,125**
			Contingency	30.0%	$77,738
			Sales Tax	9.3%	$24,099
			2015 Planning Level Construction Cost =		**$360,962**

ASSUMPTIONS:
The estimate of $250,000 is the City's Planning Level Construction Cost. Project cost is highly variable and a Geotechnical evaluation of the site will be required.



Parametrix

N

0 60 120

Feet

- Discharge Point
- Control Structure
- Catchment
- WQ Facility
- Open Channel
- Storm Main

Capital Project and Rank

- High
- Medium
- Low
- Proposed Drain Pipe
- Proposed Catch Basin

- Streams
- 100 Year Flood
- Drainage Basin
- City Limits

Capital Project 12.
1st Place South (201st to 204th)
Pipe Upgrade

City of Des Moines
Surface Water Comprehensive Plan

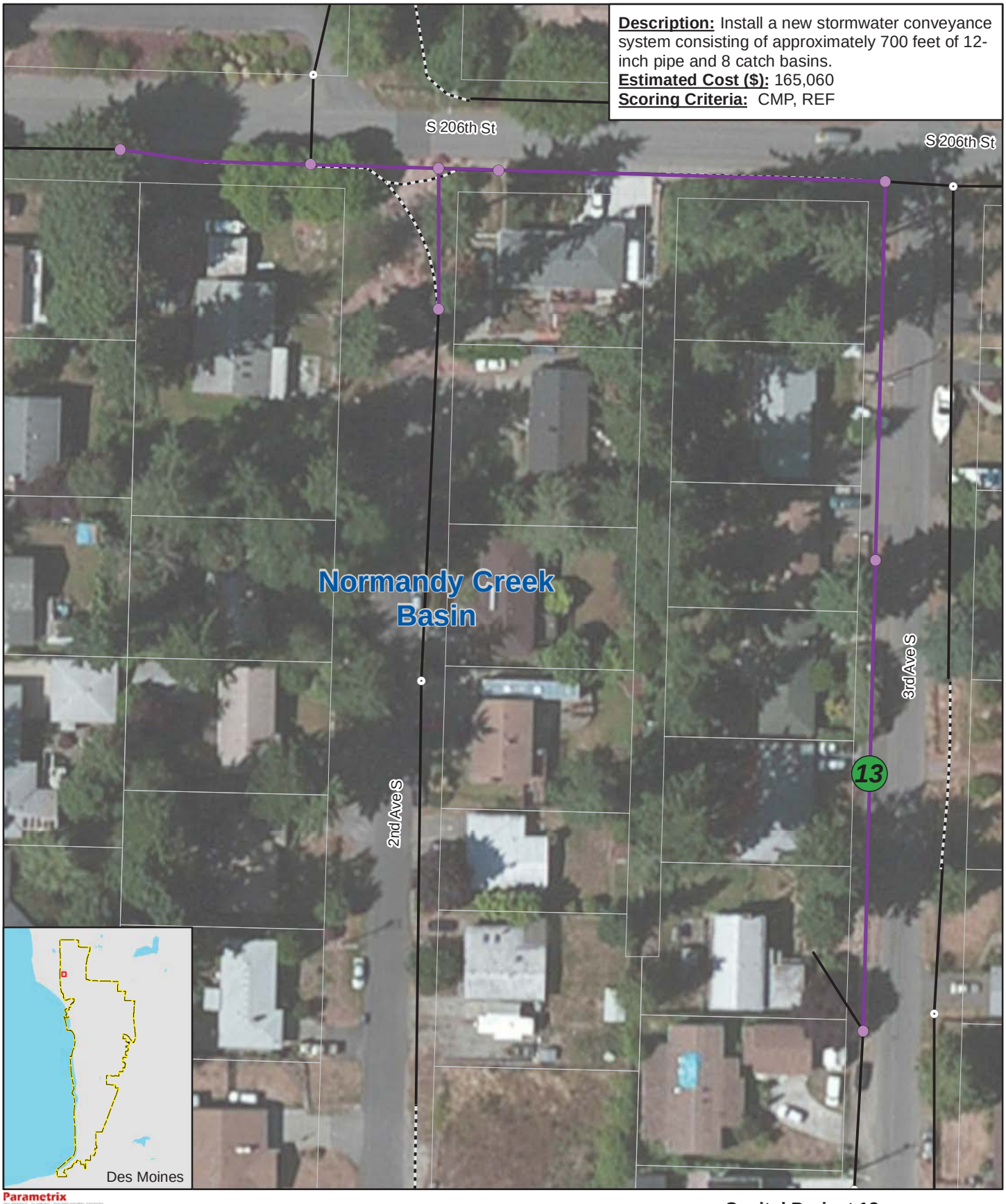
CITY OF DES MOINES
2015 Comprehensive Stormwater Plan Update
Preliminary Opinion of Probable Cost

Capital Project 12
Project Name: 1st Place South (201st to 204th) Pipe Upgrade
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:

New 18" SD system and curb along E side of 1st Pl S. New SD system on N side of S 202nd St. S of S 202nd St the SD system will replace the existing storm CBs and storm pipe. Improvements on S 202nd St will include 12" SD system, 2-feet-wide pavement, and curb (approx. 320 LF total) on both N and S sides of the road. 18" SD system will connect to 1st Ave Pond Expansion CIP at the N end of 1st Pl S. Connection will cross approx. 55 LF of pavement and 115LF of vegetated area. Typically, Type 1 and Type 2 CBs will be installed along the curb flowline.

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	$18,700	$18,700
2	1	LS	Traffic Control	$3,600	$3,600
3	1	LS	Erosion/Sedimentation Control	$3,600	$3,600
4	1530	LF	Pavement Restoration	$20	$30,600
5	430	LF	Schedule A Storm Sewer Pipe, 12-Inch Diameter	$60	$25,800
6	1100	LF	Schedule A Storm Sewer Pipe, 18-Inch Diameter	$80	$88,000
7	3	EA	Catch Basin Type I	$1,930	$5,790
8	6	EA	Catch Basin Type II, 48" Diam.	$4,880	$29,280
9					
10					
			Construction Subtotal (2014 Dollars) =		$205,370
			Inflation from 2014 to 2015	3.65%	$7,496
			Construction Subtotal (2015 Dollars) =		**$212,866**
			Contingency	30.0%	$63,860
			Sales Tax	9.3%	$19,797
			Planning Level Construction Cost =		**$296,500**
			Environmental Permitting and Documentation	5.0%	$14,825
			Administration	5.0%	$14,825
			Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	$88,950
			2015 TOTAL =		**$415,100**

ASSUMPTIONS:
Length of pipe, pipe diameter, number of structures and structure size were provided by City of Des Moines.
Mobilization equals approximately 10-percent of Subtotal.
Traffic Control equals approximately 2-percent of Subtotal.
Erosion/Sedimentation Control equals approximately 2-percent of Subtotal ($1,000 min).
Pavement Restoration includes the cost of HMA (2-inch), CSTC (2-inch), and CSBC (4-inch).
Cost of pipe installation includes structure excavation and shoring.
Cost of catch basin installation includes structure excavation and shoring.



Parametrix

N

0 30 60

Feet

- Discharge Point
- Control Structure
- Catchment
- WQ Facility
- Open Channel
- Storm Main

Capital Project and Rank

- High
- Medium
- Low
- Proposed Drain Pipe
- Proposed Catch Basin

- Streams
- 100 Year Flood
- Drainage Basin
- City Limits

Capital Project 13.
3rd Avenue (206th to 207th)
Pipe Project

City of Des Moines
Surface Water Comprehensive Plan

CITY OF DES MOINES
2015 Comprehensive Stormwater Plan Update
Preliminary Opinion of Probable Cost

Capital Project 13
Project Name: 3rd Avenue (206th to 207th) Pipe Project
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:

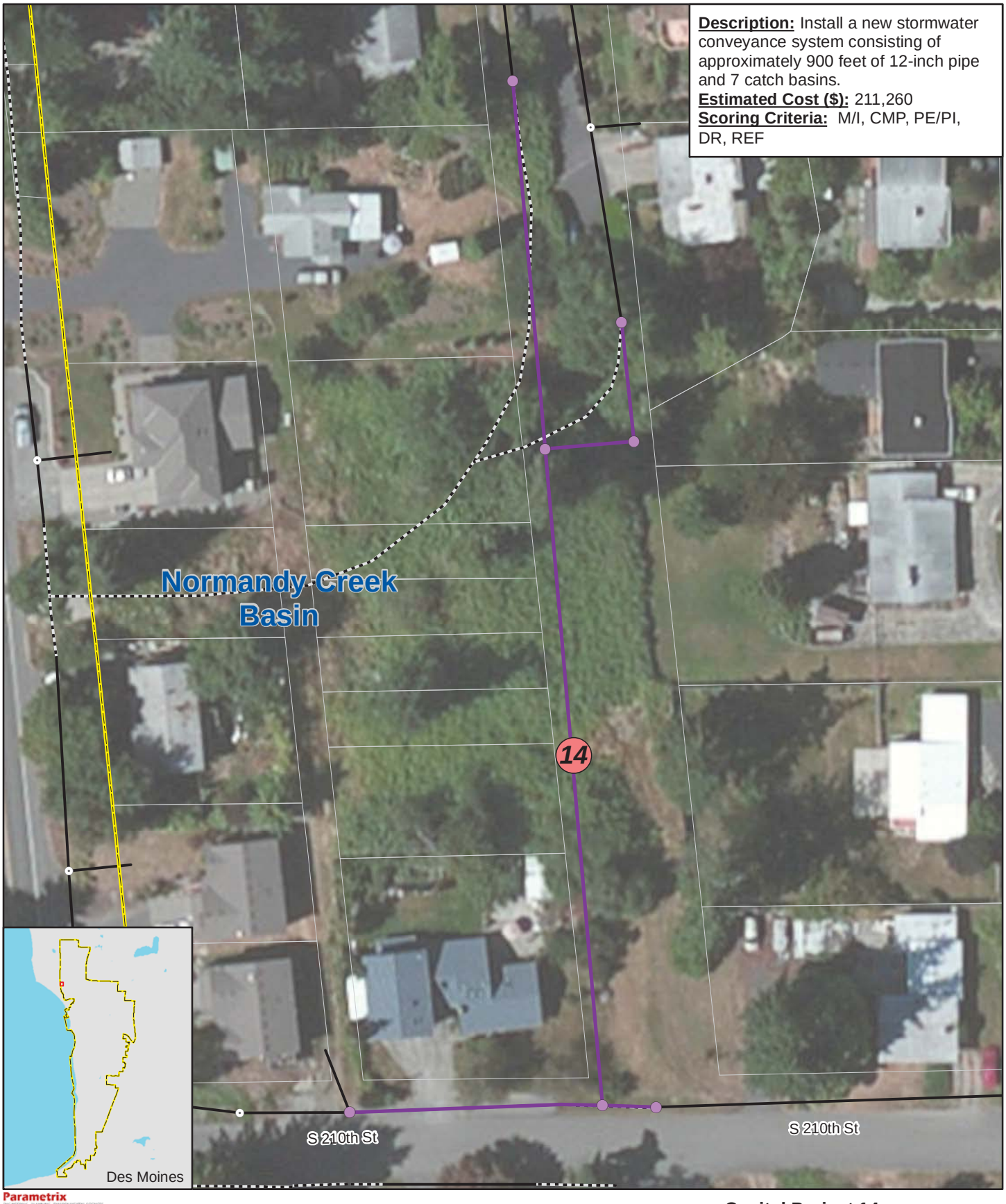
New 12" SD system, 2-foot wide pavement, and curb (approx 840 LF total)on W side of 3rd Ave S, and S side of S 206th St. New 12" SD on S side of S 206th St will connect to existing SD system from SE corner of intersection of 3rd Ave S and S 206th St and connect to existing SD system between 1st Pl S and 3rd Ave S. Improvements also include connecting existing SD system from 2nd Ave S to new 12" SD system in S 206th St (approx. 125 LF through vegetation).

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	$7,400	$7,400
2	1	LS	Traffic Control	$1,400	$1,400
3	1	LS	Erosion/Sedimentation Control	$1,400	$1,400
4	700	LF	Pavement Restoration	$20	$14,000
5	700	LF	Schedule A Storm Sewer Pipe, 12-Inch Diameter	$60	$42,000
6	8	EA	Catch Basin Type I	$1,930	$15,440
7					
8					
9					
10					

Construction Subtotal (2014 Dollars) =		$81,640
Inflation from 2014 to 2015	3.65%	$2,980
Construction Subtotal (2015 Dollars) =		**$84,620**
Contingency	30.0%	$25,386
Sales Tax	9.3%	$7,870
Planning Level Construction Cost =		**$117,900**
Environmental Permitting and Documentation	5.0%	$5,895
Administration	5.0%	$5,895
Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	$35,370
2015 TOTAL =		**$165,060**

ASSUMPTIONS:

Length of pipe, pipe diameter, number of structures and structure size were provided by City of Des Moines.
Mobilization equals approximately 10-percent of Subtotal.
Traffic Control equals approximately 2-percent of Subtotal.
Erosion/Sedimentation Control equals approximately 2-percent of Subtotal ($1,000 min).
Pavement Restoration includes the cost of HMA (2-inch), CSTC (2-inch), and CSBC (4-inch).
Cost of pipe installation includes structure excavation and shoring.
Cost of catch basin installation includes structure excavation and shoring.



Parametrix

N

0 25 50

Feet

- Discharge Point
- Control Structure
- Catchment
- WQ Facility
- Open Channel
- Storm Main

Capital Project and Rank

- High
- Medium
- Low
- Proposed Drain Pipe
- Proposed Catch Basin

- Streams
- 100 Year Flood
- Drainage Basin
- City Limits

Capital Project 14.
1st Place South (209th to 210th) Pipe Project

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Capital Project 14
Project Name: 1st Place South (209th to 210th) Pipe Project
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:

New 12" SD system that will extend existing SD on both E and W sides of 1st Pl S and connect to existing SD on S 210th St. Curb not needed on 1st Pl S. New 12" SD system will cross approx 445 LF of vegetated area prior to connecting to new 12" SD system on N side of S 210th St. New curb and 12" SD system on N side of S 210th St will replace existing ditch and connect to existing SD system via CB betweeen 1ST Pl S and 1st Ave S.

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	$9,500	$9,500
2	1	LS	Traffic Control	$1,800	$1,800
3	1	LS	Erosion/Sedimentation Control	$1,800	$1,800
4	900	LF	Pavement Restoration	$20	$18,000
5	900	LF	Schedule A Storm Sewer Pipe, 12-Inch Diameter	$60	$54,000
6	5	EA	Catch Basin Type I	$1,930	$9,650
7	2	EA	Catch Basin Type II, 48" Diam.	$4,880	$9,760
8					
9					
10					

Construction Subtotal (2014 Dollars) =		$104,510
Inflation from 2014 to 2015	3.65%	$3,815
Construction Subtotal (2015 Dollars) =		**$108,325**
Contingency	30.0%	$32,498
Sales Tax	9.3%	$10,074
Planning Level Construction Cost =		**$150,900**
Environmental Permitting and Documentation	5.0%	$7,545
Administration	5.0%	$7,545
Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	$45,270
2015 TOTAL =		**$211,260**

ASSUMPTIONS:
Length of pipe, pipe diameter, number of structures and structure size were provided by City of Des Moines.
Mobilization equals approximately 10-percent of Subtotal.
Traffic Control equals approximately 2-percent of Subtotal.
Erosion/Sedimentation Control equals approximately 2-percent of Subtotal ($1,000 min).
Pavement Restoration includes the cost of HMA (2-inch), CSTC (2-inch), and CSBC (4-inch).
Cost of pipe installation includes structure excavation and shoring.
Cost of catch basin installation includes structure excavation and shoring.

Parametrix

N

0 50 100

Feet

- Discharge Point
- Control Structure
- Catchment
- WQ Facility
- Open Channel
- Storm Main

Capital Project and Rank

- High
- Medium
- Low
- Proposed Drain Pipe
- Proposed Catch Basin

- Streams
- 100 Year Flood
- Drainage Basin
- City Limits

Capital Project 15.
3rd Avenue South (213th to 216th) Pipe Project

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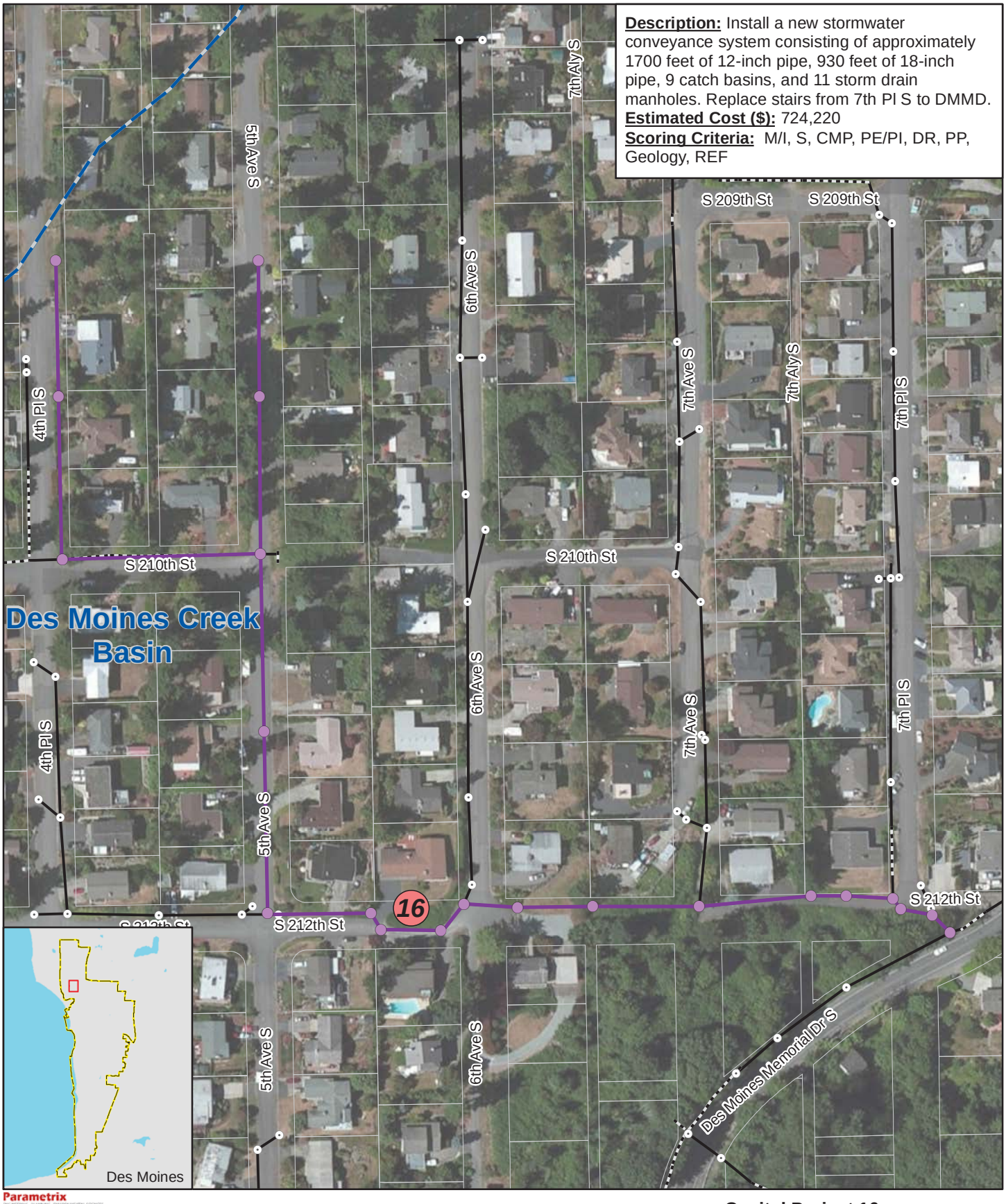
Capital Project 15
Project Name: 3rd Avenue South (213th to 216th) Pipe Project
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:

New 12" SD system on the S side of S 213th St replace existing ditch. New 12" SD system on 3rd Ave S to collect runoff on E side of street and drain south to S 216th St. New 12" SD system on the N side of S 216th St will connect to existing CB located at NW corner of intersection with 4th Ave S.

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	$14,500	$14,500
2	1	LS	Traffic Control	$2,800	$2,800
3	1	LS	Erosion/Sedimentation Control	$2,800	$2,800
4	1500	LF	Pavement Restoration	$20	$30,000
5	1500	LF	Schedule A Storm Sewer Pipe, 12-Inch Diameter	$60	$90,000
6	10	EA	Catch Basin Type I	$1,930	$19,300
7					
8					
9					
10					
			Construction Subtotal (2014 Dollars) =		$159,400
			Inflation from 2014 to 2015	3.65%	$5,818
			Construction Subtotal (2015 Dollars) =		**$165,218**
			Contingency	30.0%	$49,565
			Sales Tax	9.3%	$15,365
			Planning Level Construction Cost =		**$230,100**
			Environmental Permitting and Documentation	5.0%	$11,505
			Administration	5.0%	$11,505
			Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	$69,030
			2015 TOTAL =		**$322,140**

ASSUMPTIONS:
Length of pipe, pipe diameter, number of structures and structure size were provided by City of Des Moines.
Mobilization equals approximately 10-percent of Subtotal.
Traffic Control equals approximately 2-percent of Subtotal.
Erosion/Sedimentation Control equals approximately 2-percent of Subtotal ($1,000 min).
Pavement Restoration includes the cost of HMA (2-inch), CSTC (2-inch), and CSBC (4-inch).
Cost of pipe installation includes structure excavation and shoring.
Cost of catch basin installation includes structure excavation and shoring.



Capital Project 16.
5th Avenue South/212th Street Pipe Upgrade

City of Des Moines
Surface Water Comprehensive Plan

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Preliminary Opinion of Probable Cost

Capital Project 16
Project Name: 5th Avenue South/212th Street Pipe Upgrade
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:

New 12" SD system on the E side of 4th Pl S and 5th Ave S to connect to new 12" SD system on N side of S 210th St. New 12" SD system on S 210th St to replace existing ditches and culverts on N side of street. New 12" SD system on 5th Ave S in curb and gutter line on E side of street from S 210th St to S 212th St. New 18" SD system on S 212th St that will connect to SD system on DMMD. Replace stairs from 7th Pl S to DMMD

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	$32,600	$32,600
2	1	LS	Traffic Control	$6,300	$6,300
3	1	LS	Erosion/Sedimentation Control	$6,300	$6,300
4	2630	LF	Pavement Restoration	$20	$52,600
5	1700	LF	Schedule A Storm Sewer Pipe, 12-Inch Diameter	$60	$102,000
6	930	LF	Schedule A Storm Sewer Pipe, 18-Inch Diameter	$80	$74,400
7	9	EA	Catch Basin Type I	$1,930	$17,370
8	11	EA	Catch Basin Type II, 48" Diam.	$4,880	$53,680
9	100	LF	Concrete Stair with Metal Handrail	$130	$13,000
10					
			Construction Subtotal (2014 Dollars) =		$358,250
			Inflation from 2014 to 2015	3.65%	$13,076
			Construction Subtotal (2015 Dollars) =		**$371,326**
			Contingency	30.0%	$111,398
			Sales Tax	9.3%	$34,533
			Planning Level Construction Cost =		**$517,300**
			Environmental Permitting and Documentation	5.0%	$25,865
			Administration	5.0%	$25,865
			Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	$155,190
			2015 TOTAL =		**$724,220**

ASSUMPTIONS:
Length of pipe, pipe diameter, number of structures and structure size were provided by City of Des Moines.
Mobilization equals approximately 10-percent of Subtotal.
Traffic Control equals approximately 2-percent of Subtotal.
Erosion/Sedimentation Control equals approximately 2-percent of Subtotal ($1,000 min).
Pavement Restoration includes the cost of HMA (2-inch), CSTC (2-inch), and CSBC (4-inch).
Cost of pipe installation includes structure excavation and shoring.
Cost of catch basin installation includes structure excavation and shoring.
Cost includes rebuilding of stairs from 7th Pl S to DMMD

Description: Replace the existing ditches and storm drain pipes, with approximately 310 feet of 12-inch pipe, 300 feet of 18-inch pipe, 170 feet of 24-inch pipe, 3 catch basins and 7 storm drain manholes.
Estimated Cost ($): 258,300
Scoring Criteria: $, M/I, S, CMP, DR, PP, REF

Parametrix

N
0 30 60
Feet

- Discharge Point
- Control Structure
- Catchment
- WQ Facility
- Open Channel
- Storm Main

Capital Project and Rank
- High
- Medium
- Low
- Proposed Drain Pipe
- Proposed Catch Basin

- Streams
- 100 Year Flood
- Drainage Basin
- City Limits

Capital Project 17.
216th Place/Marine View Drive
Pipe Upgrade

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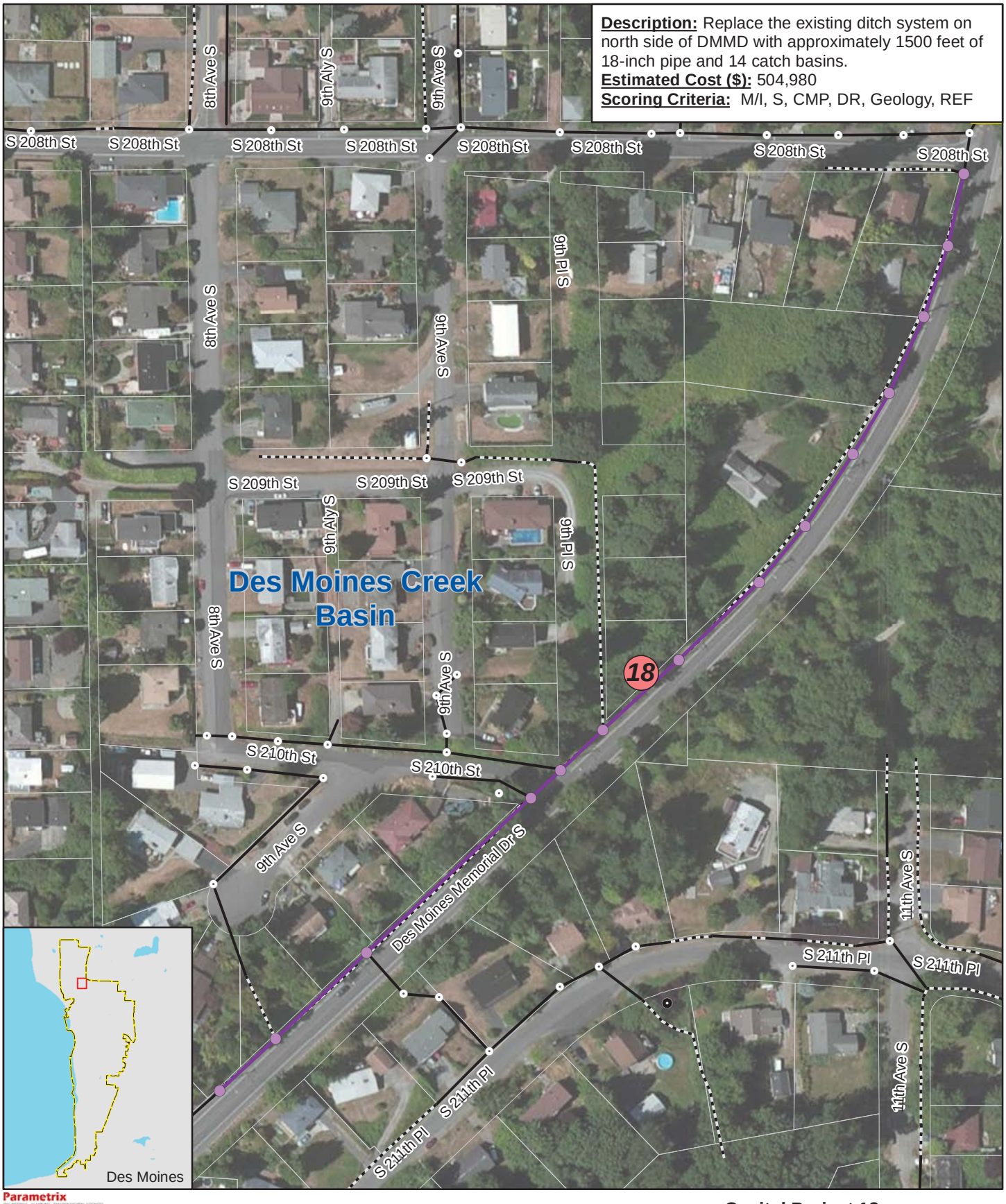
Capital Project 17
Project Name: 216th Place/Marine View Drive Pipe Upgrade
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:
New 12" SD system to replace ditches on W side of 6th Ave S and W side of DMMD. Install Curb and CBs at pavement edge. Tie into existing structures SW of 6th Ave S cul-de-sac; replace ditch with 18" SD system. Upgrade to 24" SD system across Marine View Dr S intersection. Two new Type 2 CBs in Marive View Dr S, tie into existing SD structure SE of intersection.

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	$11,600	$11,600
2	1	LS	Traffic Control	$2,200	$2,200
3	1	LS	Erosion/Sedimentation Control	$2,200	$2,200
4	610	LF	Pavement Restoration	$20	$12,200
5	310	LF	Schedule A Storm Sewer Pipe, 12-Inch Diameter	$60	$18,600
6	300	LF	Schedule A Storm Sewer Pipe, 18-Inch Diameter	$80	$24,000
7	170	LF	Schedule A Storm Sewer Pipe, 24-Inch Diameter	$100	$17,000
8	3	EA	Catch Basin Type I	$1,930	$5,790
9	7	EA	Catch Basin Type II, 48" Diam.	$4,880	$34,160
10					
			Construction Subtotal (2014 Dollars) =		$127,750
			Inflation from 2014 to 2015	3.65%	$4,663
			Construction Subtotal (2015 Dollars) =		**$132,413**
			Contingency	30.0%	$39,724
			Sales Tax	9.3%	$12,314
			Planning Level Construction Cost =		**$184,500**
			Environmental Permitting and Documentation	5.0%	$9,225
			Administration	5.0%	$9,225
			Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	$55,350
			2015 TOTAL =		**$258,300**

ASSUMPTIONS:
Length of pipe, pipe diameter, number of structures and structure size were provided by City of Des Moines.
Mobilization equals approximately 10-percent of Subtotal.
Traffic Control equals approximately 2-percent of Subtotal.
Erosion/Sedimentation Control equals approximately 2-percent of Subtotal ($1,000 min).
Pavement Restoration includes the cost of HMA (2-inch), CSTC (2-inch), and CSBC (4-inch).
Cost of pipe installation includes structure excavation and shoring.
Cost of catch basin installation includes structure excavation and shoring.



Parametrix

N

0 70 140

Feet

- Discharge Point
- Control Structure
- Catchment
- WQ Facility
- Open Channel
- Storm Main

Capital Project and Rank

- High
- Medium
- Low
- Proposed Drain Pipe
- Proposed Catch Basin

- Streams
- 100 Year Flood
- Drainage Basin
- City Limits

Capital Project 18.
Des Moines Memorial Drive - S. 208th to S. 212th Pipe Project

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Capital Project 18
Project Name: Des Moines Memorial Drive - S. 208th to S. 212th Pipe Project
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:

New 18" SD system to replace ditches on NW side of DMMD. From S 208th St to S 210th St, add 2' of pavement and curb from existing paved edge. Install new curb at pavement edge (new or existing) for entire improvment segment. Install Type 2 CBs at new curb flowline. Install new SDMH with vaned grate at intersection of S 208th St and DMMD. Replace existing SDMH's where existing structures will be connected to from S 210th St and 9th Pl S and side neighborhoods. Improvements will not impact existing power/telephone poles that are located in existing ditchline.

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	$22,700	$22,700
2	1	LS	Traffic Control	$4,400	$4,400
3	1	LS	Erosion/Sedimentation Control	$4,400	$4,400
4	1500	LF	Pavement Restoration	$20	$30,000
5	1500	LF	Schedule A Storm Sewer Pipe, 18-Inch Diameter	$80	$120,000
6	14	EA	Catch Basin Type II, 48" Diam.	$4,880	$68,320
7					
8					
9					
10					
			Construction Subtotal (2014 Dollars) =		$249,820
			Inflation from 2014 to 2015	3.65%	$9,118
			Construction Subtotal (2015 Dollars) =		**$258,938**
			Contingency	30.0%	$77,681
			Sales Tax	9.3%	$24,081
			Planning Level Construction Cost =		**$360,700**
			Environmental Permitting and Documentation	5.0%	$18,035
			Administration	5.0%	$18,035
			Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	$108,210
			2015 TOTAL =		**$504,980**

ASSUMPTIONS:
Length of pipe, pipe diameter, number of structures and structure size were provided by City of Des Moines.
Mobilization equals approximately 10-percent of Subtotal.
Traffic Control equals approximately 2-percent of Subtotal.
Erosion/Sedimentation Control equals approximately 2-percent of Subtotal ($1,000 min).
Pavement Restoration includes the cost of HMA (2-inch), CSTC (2-inch), and CSBC (4-inch).
Cost of pipe installation includes structure excavation and shoring.
Cost of catch basin installation includes structure excavation and shoring.

Capital Project 19.
14th Avenue/15th Avenue N/O
215th Place Pipe Project

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Capital Project 19
Project Name: 14th Avenue/15th Avenue N/O 215th Place Pipe Project
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:
New 12" SD system, curb and gutter to replace existing curb on E side of 14th Ave S. Connect to existing SD system at NE corner of intersection with S 215th Pl. New 12" SD system, curb and gutter to replace existing curb and gutter on E side of 15th Ave S. Connect to existing SDMH in front of driveway at 21254 15th Ave S.

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	$5,000	$5,000
2	1	LS	Traffic Control	$1,000	$1,000
3	1	LS	Erosion/Sedimentation Control	$1,000	$1,000
4	500	LF	Pavement Restoration	$20	$10,000
5	500	LF	Schedule A Storm Sewer Pipe, 12-Inch Diameter	$60	$30,000
6	4	EA	Catch Basin Type I	$1,930	$7,720
7					
8					
9					
10					

Construction Subtotal (2014 Dollars) =		$54,720
Inflation from 2014 to 2015	3.65%	$1,997
Construction Subtotal (2015 Dollars) =		**$56,717**
Contingency	30.0%	$17,015
Sales Tax	9.3%	$5,275
Planning Level Construction Cost =		**$79,000**
Environmental Permitting and Documentation	5.0%	$3,950
Administration	5.0%	$3,950
Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	$23,700
2015 TOTAL =		**$110,600**

ASSUMPTIONS:
Length of pipe, pipe diameter, number of structures and structure size were provided by City of Des Moines.
Mobilization equals approximately 10-percent of Subtotal.
Traffic Control equals approximately 2-percent of Subtotal.
Erosion/Sedimentation Control equals approximately 2-percent of Subtotal ($1,000 min).
Pavement Restoration includes the cost of HMA (2-inch), CSTC (2-inch), and CSBC (4-inch).
Cost of pipe installation includes structure excavation and shoring.
Cost of catch basin installation includes structure excavation and shoring.

Parametrix

Discharge Point
Control Structure
Catchment
WQ Facility
Open Channel
Storm Main

N
0 75 150
Feet

Capital Project and Rank
High
Medium
Low
Proposed Drain Pipe
Proposed Catch Basin

Streams
100 Year Flood
Drainage Basin
City Limits

Capital Project 20.
222nd/223rd 8th Avenue to 11th Avenue Pipe Project

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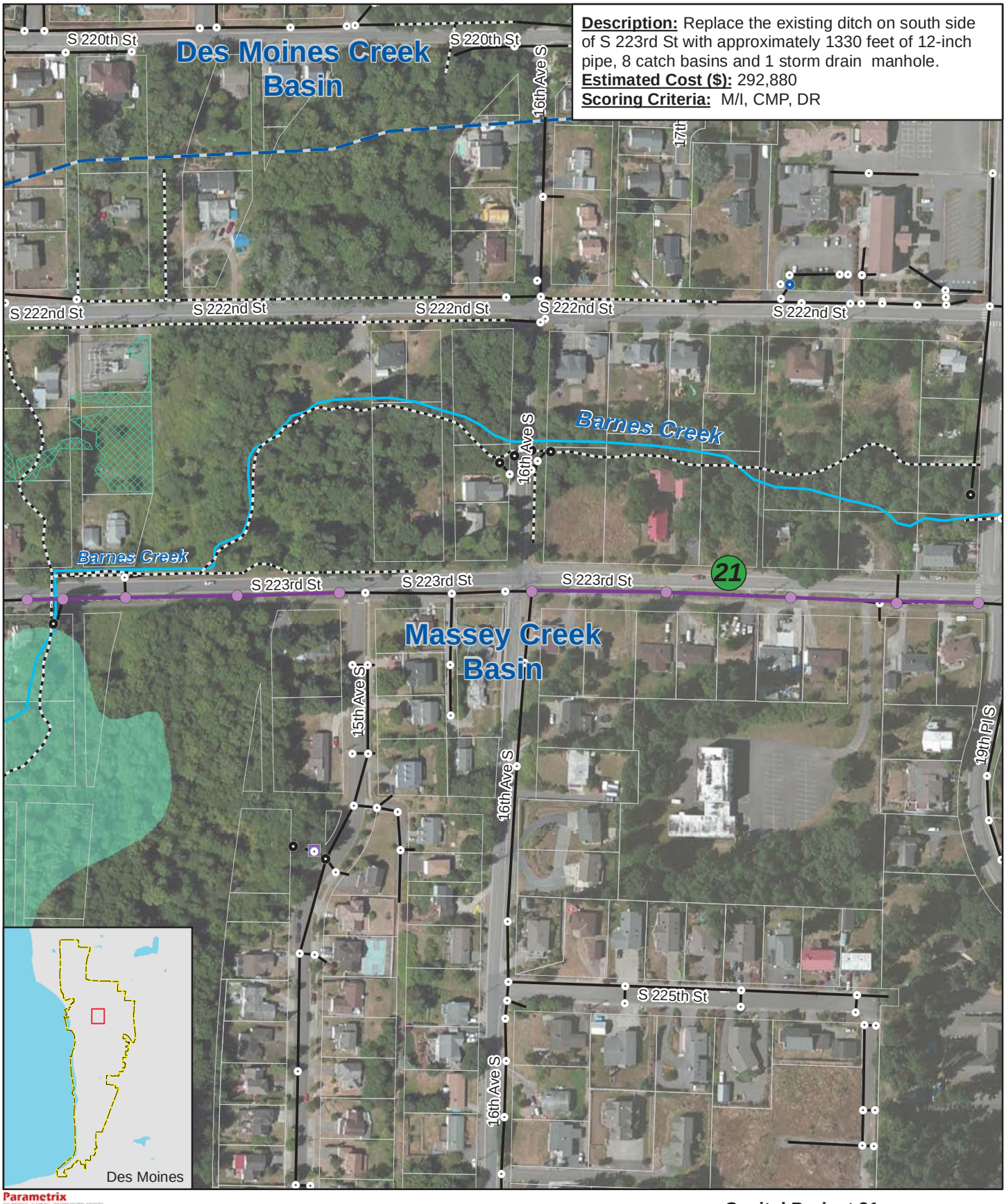
Capital Project 20
Project Name: 222nd/223rd 8th Avenue to 11th Avenue Pipe Project
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:

New 12" SD system on W side of 11th Ave S and N side of S 222nd St. Install new curb at existing paved edge along 11th Ave S and S 222nd St. Connect storm pipe to existing CB at NE corner of S 222nd St and 10th Pl S. Install new SD system that will replace existing ditch on N side of S 222nd St. SD system will begin with a new CB that will connect to existing culvert end at NW corner of S 222nd St and 9th Ave S. Install new curb at pavement edge for entire improvment segment. All new Type 1 CBs. Install new CB to connect with existing 8th Ave S pipe at in NW corner intersection with S 222nd St. Install new CB to connect with existing culvert at NE corner of alley between Marine View Dr S and 8th Ave S. Install new SD system along existing curb on W side of 9th Ave S. Install new SD system and new curb at W edge of pavement on 10th Ave S. New SD systems on 9 Ave S and 10th Ave S will connect to existing SD system on north side of S 223rd St. Install new SD system and new curb at S edge of pavement on S 223rd St between 10th Ave S and 9th Ave S. Connect SD to new 9th Ave S SD system that will extend S to the end of the gravel driveway. Project description and estimate does no consider any existing underground utilities that may exist.

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	$21,200	$21,200
2	1	LS	Traffic Control	$4,100	$4,100
3	1	LS	Erosion/Sedimentation Control	$4,100	$4,100
4	2070	LF	Pavement Restoration	$20	$41,400
5	2070	LF	Schedule A Storm Sewer Pipe, 12-Inch Diameter	$60	$124,200
6	20	EA	Catch Basin Type I	$1,930	$38,600
7					
8					
9					
10					
			Construction Subtotal (2014 Dollars) =		$233,600
			Inflation from 2014 to 2015	3.65%	$8,526
			Construction Subtotal (2015 Dollars) =		**$242,126**
			Contingency	30.0%	$72,638
			Sales Tax	9.3%	$22,518
			Planning Level Construction Cost =		**$337,300**
			Environmental Permitting and Documentation	5.0%	$16,865
			Administration	5.0%	$16,865
			Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	$101,190
			2015 TOTAL =		**$472,220**

ASSUMPTIONS:
Length of pipe, pipe diameter, number of structures and structure size were provided by City of Des Moines.
Mobilization equals approximately 10-percent of Subtotal.
Traffic Control equals approximately 2-percent of Subtotal.
Erosion/Sedimentation Control equals approximately 2-percent of Subtotal ($1,000 min).
Pavement Restoration includes the cost of HMA (2-inch), CSTC (2-inch), and CSBC (4-inch).
Cost of pipe installation includes structure excavation and shoring.
Cost of catch basin installation includes structure excavation and shoring.



Capital Project 21.
223rd Street (13th Avenue to 19th Avenue) Pipe Project

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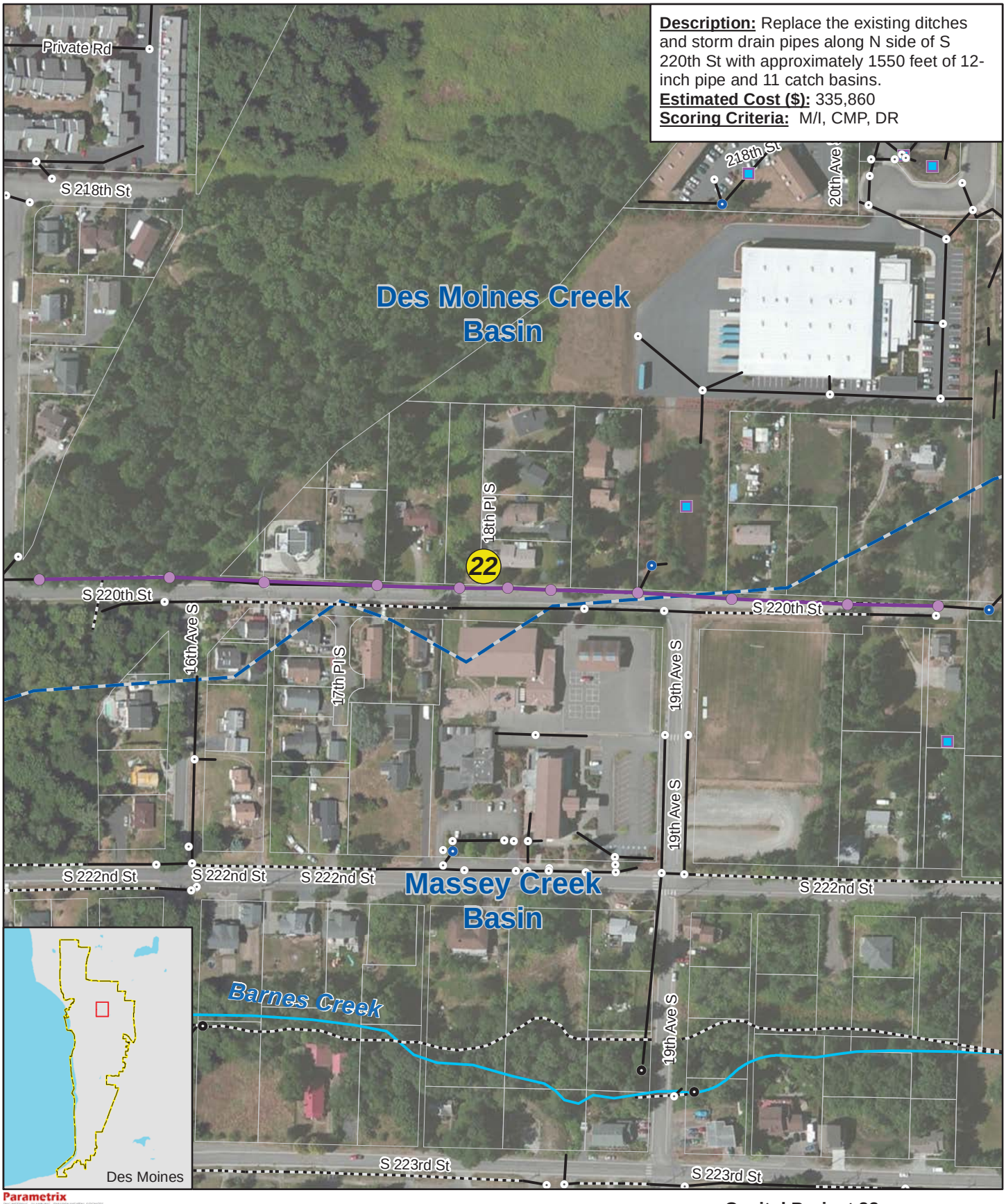
Capital Project 21
Project Name: 223rd Street (13th Avenue to 19th Avenue) Pipe Project
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:
New 12" SD along S side of S 223rd St to replace roadside ditches. Install 2-foot paved shoulder, curb, and CBs at pavement edge. Maintain existing culvert from 16th Ave S and 15th Ave S.

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	$13,200	$13,200
2	1	LS	Traffic Control	$2,500	$2,500
3	1	LS	Erosion/Sedimentation Control	$2,500	$2,500
4	1330	LF	Pavement Restoration	$20	$26,600
5	1330	LF	Schedule A Storm Sewer Pipe, 12-Inch Diameter	$60	$79,800
6	8	EA	Catch Basin Type I	$1,930	$15,440
7	1	EA	Catch Basin Type II, 48" Diam.	$4,880	$4,880
8					
9					
10					
			Construction Subtotal (2014 Dollars) =		$144,920
			Inflation from 2014 to 2015	3.65%	$5,290
			Construction Subtotal (2015 Dollars) =		**$150,210**
			Contingency	30.0%	$45,063
			Sales Tax	9.3%	$13,970
			Planning Level Construction Cost =		**$209,200**
			Environmental Permitting and Documentation	5.0%	$10,460
			Administration	5.0%	$10,460
			Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	$62,760
			2015 TOTAL =		**$292,880**

ASSUMPTIONS:
Length of pipe, pipe diameter, number of structures and structure size were provided by City of Des Moines.
Mobilization equals approximately 10-percent of Subtotal.
Traffic Control equals approximately 2-percent of Subtotal.
Erosion/Sedimentation Control equals approximately 2-percent of Subtotal ($1,000 min).
Pavement Restoration includes the cost of HMA (2-inch), CSTC (2-inch), and CSBC (4-inch).
Cost of pipe installation includes structure excavation and shoring.
Cost of catch basin installation includes structure excavation and shoring.



Capital Project 22.
220th Street (15th Ave to SJU Park) Pipe Replacement Project

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Capital Project 22
Project Name: 220th Street (15th Ave to SJU Park) Pipe Replacement Project
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:
New SD along N side of S 220th St. Install curb and new CBs at edge of existing pavement (15th Ave S to 18th Pl S). Install new 2-foot paved shoulder, curb, and CBs at pavement edge from 18th Pl S to 19th Ave S. Repair gravel road between 19th Ave S and eastern end of project.

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	$15,100	$15,100
2	1	LS	Traffic Control	$2,900	$2,900
3	1	LS	Erosion/Sedimentation Control	$2,900	$2,900
4	1550	LF	Pavement Restoration	$20	$31,000
5	1550	LF	Schedule A Storm Sewer Pipe, 12-Inch Diameter	$60	$93,000
6	11	EA	Catch Basin Type I	$1,930	$21,230
7					
8					
9					
10					
			Construction Subtotal (2014 Dollars) =		$166,130
			Inflation from 2014 to 2015	3.65%	$6,064
			Construction Subtotal (2015 Dollars) =		**$172,194**
			Contingency	30.0%	$51,658
			Sales Tax	9.3%	$16,014
			Planning Level Construction Cost =		**$239,900**
			Environmental Permitting and Documentation	5.0%	$11,995
			Administration	5.0%	$11,995
			Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	$71,970
			2015 TOTAL =		**$335,860**

ASSUMPTIONS:
Length of pipe, pipe diameter, number of structures and structure size were provided by City of Des Moines.
Mobilization equals approximately 10-percent of Subtotal.
Traffic Control equals approximately 2-percent of Subtotal.
Erosion/Sedimentation Control equals approximately 2-percent of Subtotal ($1,000 min).
Pavement Restoration includes the cost of HMA (2-inch), CSTC (2-inch), and CSBC (4-inch).
Cost of pipe installation includes structure excavation and shoring.
Cost of catch basin installation includes structure excavation and shoring.

Capital Project 23.
24th Avenue (223rd to 224th)
Pipe Upgrade

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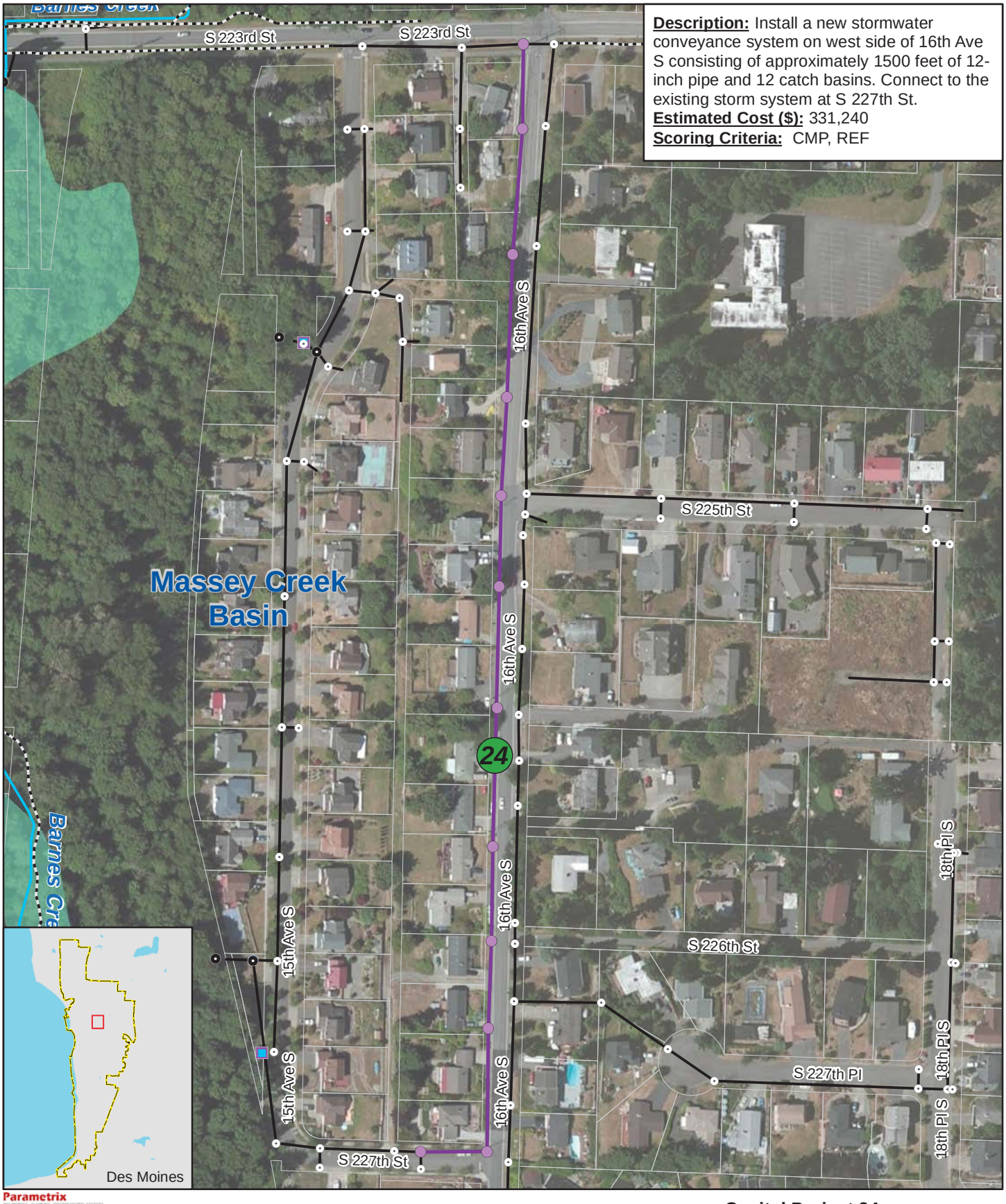
Capital Project 23
Project Name: 24th Avenue (223rd to 224th) Pipe Upgrade
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:
Replace CBs and SD on E side of 24th Ave S. Install 2-foot paved shoulder, curb, and CBs at edge of pavement. Install CB on N side of S 224th St to replace roadside ditch (connect to ex culvert).

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	$10,200	$10,200
2	1	LS	Traffic Control	$2,000	$2,000
3	1	LS	Erosion/Sedimentation Control	$2,000	$2,000
4	570	LF	Pavement Restoration	$20	$11,400
5	570	LF	Schedule A Storm Sewer Pipe, 24-Inch Diameter	$100	$57,000
6	6	EA	Catch Basin Type II, 48" Diam.	$4,880	$29,280
7					
8					
9					
10					
			Construction Subtotal (2014 Dollars) =		$111,880
			Inflation from 2014 to 2015	3.65%	$4,084
			Construction Subtotal (2015 Dollars) =		**$115,964**
			Contingency	30.0%	$34,789
			Sales Tax	9.3%	$10,785
			Planning Level Construction Cost =		**$161,500**
			Environmental Permitting and Documentation	5.0%	$8,075
			Administration	5.0%	$8,075
			Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	$48,450
			2015 TOTAL =		**$226,100**

ASSUMPTIONS:
Length of pipe, pipe diameter, number of structures and structure size were provided by City of Des Moines.
Mobilization equals approximately 10-percent of Subtotal.
Traffic Control equals approximately 2-percent of Subtotal.
Erosion/Sedimentation Control equals approximately 2-percent of Subtotal ($1,000 min).
Pavement Restoration includes the cost of HMA (2-inch), CSTC (2-inch), and CSBC (4-inch).
Cost of pipe installation includes structure excavation and shoring.
Cost of catch basin installation includes structure excavation and shoring.



Description: Install a new stormwater conveyance system on west side of 16th Ave S consisting of approximately 1500 feet of 12-inch pipe and 12 catch basins. Connect to the existing storm system at S 227th St.
Estimated Cost ($): 331,240
Scoring Criteria: CMP, REF

Parametrix

N
0 80 160
Feet

- Discharge Point
- Control Structure
- Catchment
- WQ Facility
- Open Channel
- Storm Main

Capital Project and Rank
- High
- Medium
- Low
- Proposed Drain Pipe
- Proposed Catch Basin

- Streams
- 100 Year Flood
- Drainage Basin
- City Limits

Capital Project 24.
16th Avenue (224th to 228th) Pipe Project

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Capital Project 24
Project Name: 16th Avenue (224th to 228th) Pipe Project
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:
Install new 12" SD and Type 1 CBs along W side of 16th Ave S. Install CBs along edge of existing pavement. Connect to ex CB on S 228th St, and replace curb and gutter disturbed by pipe installation.

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	$14,900	$14,900
2	1	LS	Traffic Control	$2,900	$2,900
3	1	LS	Erosion/Sedimentation Control	$2,900	$2,900
4	1500	LF	Pavement Restoration	$20	$30,000
5	1500	LF	Schedule A Storm Sewer Pipe, 12-Inch Diameter	$60	$90,000
6	12	EA	Catch Basin Type I	$1,930	$23,160
7					
8					
9					
10					
			Construction Subtotal (2014 Dollars) =		$163,860
			Inflation from 2014 to 2015	3.65%	$5,981
			Construction Subtotal (2015 Dollars) =		**$169,841**
			Contingency	30.0%	$50,952
			Sales Tax	9.3%	$15,795
			Planning Level Construction Cost =		**$236,600**
			Environmental Permitting and Documentation	5.0%	$11,830
			Administration	5.0%	$11,830
			Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	$70,980
			2015 TOTAL =		**$331,240**

ASSUMPTIONS:
Length of pipe, pipe diameter, number of structures and structure size were provided by City of Des Moines.
Mobilization equals approximately 10-percent of Subtotal.
Traffic Control equals approximately 2-percent of Subtotal.
Erosion/Sedimentation Control equals approximately 2-percent of Subtotal ($1,000 min).
Pavement Restoration includes the cost of HMA (2-inch), CSTC (2-inch), and CSBC (4-inch).
Cost of pipe installation includes structure excavation and shoring.
Cost of catch basin installation includes structure excavation and shoring.

Description: Replace the existing undersized storm drains and ditches with approximately 350 feet of 24-inch pipe, 210 feet of 36-inch pipe, and 5 storm drain manholes.
Estimated Cost ($): 227,080
Scoring Criteria: M/I, CMP, PE/PI, DR, PP, Geology, REF

Parametrix

N
0 25 50
Feet

- Discharge Point
- Control Structure
- Catchment
- WQ Facility
- Open Channel
- Storm Main

Capital Project and Rank
- High
- Medium
- Low
- Proposed Drain Pipe
- Proposed Catch Basin

- Streams
- 100 Year Flood
- Drainage Basin
- City Limits

Capital Project 25A.
KDM/16th Avenue Pipe Replacement Project

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Preliminary Opinion of Probable Cost

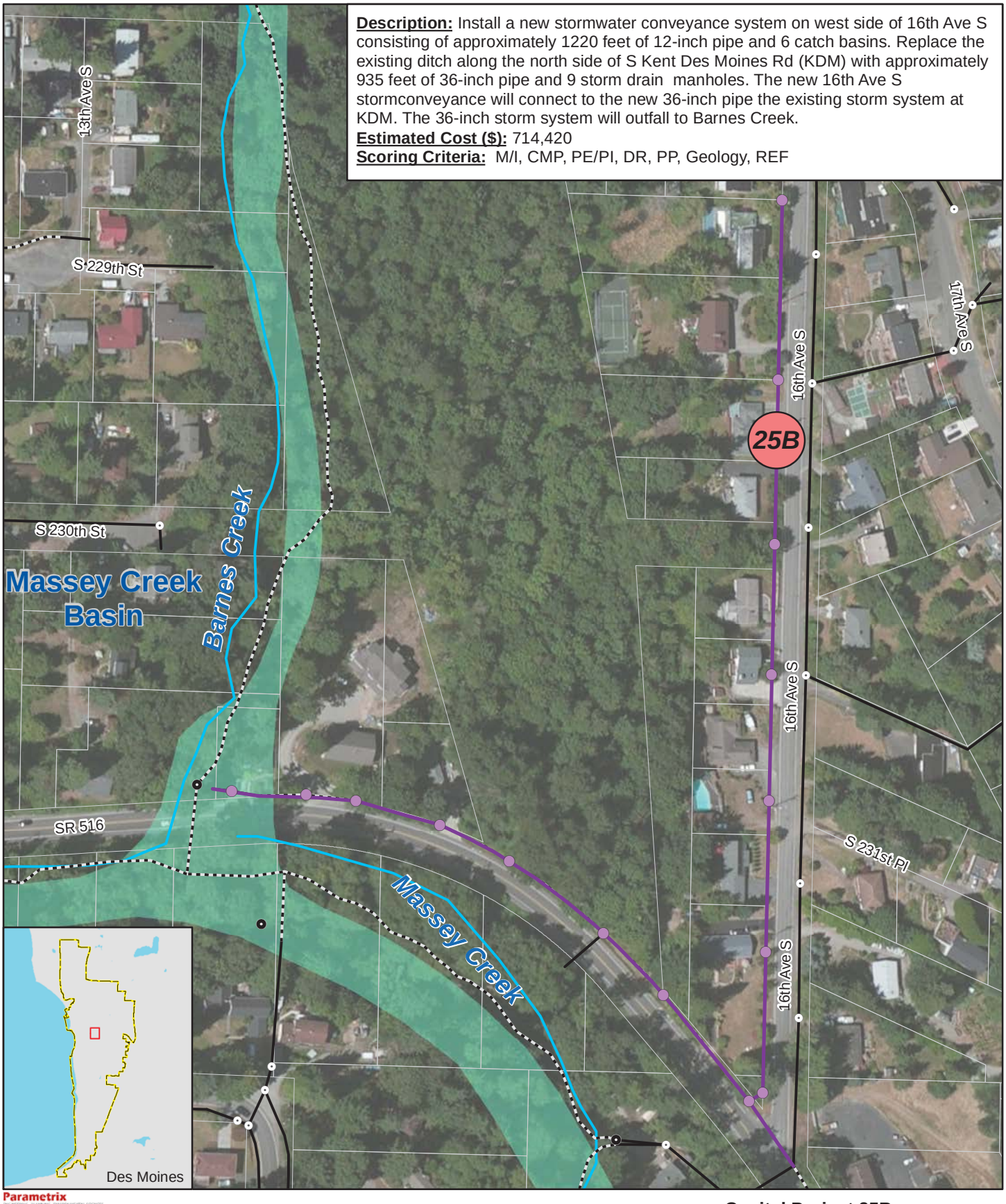
Capital Project 25A
Project Name: KDM/16th Ave Pipe Replacement Project
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:

Replace existing roadside ditch along KDM RD with 24" SD. Connect to ex 12" Conc pipe with new Type II CB at SE extents of project, and connect to ex 18" CAP with new Type II CB at SE corner of 16th Ave S.
Install new Type II CB and 24" SD SW of KDM Rd (connect CB to ex 18" CAP under KDM Rd). 24" pipe intersects with new 36" SD installed to connect ex ditch to Massey Creek.

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	$10,200	$10,200
2	1	LS	Traffic Control	$2,000	$2,000
3	1	LS	Erosion/Sedimentation Control	$2,000	$2,000
4	350	LF	Pavement Restoration	$20	$7,000
5	350	LF	Schedule A Storm Sewer Pipe, 24-Inch Diameter	$100	$35,000
6	210	LF	Schedule A Storm Sewer Pipe, 36-Inch Diameter	$140	$29,400
7	2	EA	Catch Basin Type II, 48" Diam.	$4,880	$9,760
8	3	EA	Catch Basin Type II, 60" Diam.	$5,660	$16,980
9					
10					

Construction Subtotal (2014 Dollars) =		$112,340
Inflation from 2014 to 2015	3.65%	$4,100
Construction Subtotal (2015 Dollars) =		**$116,440**
Contingency	30.0%	$34,932
Sales Tax	9.3%	$10,829
Planning Level Construction Cost =		**$162,200**
Environmental Permitting and Documentation	5.0%	$8,110
Administration	5.0%	$8,110
Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	$48,660
2015 TOTAL =		**$227,080**

ASSUMPTIONS:
Length of pipe, pipe diameter, number of structures and structure size were provided by City of Des Moines.
Mobilization equals approximately 10-percent of Subtotal.
Traffic Control equals approximately 2-percent of Subtotal.
Erosion/Sedimentation Control equals approximately 2-percent of Subtotal ($1,000 min).
Pavement Restoration includes the cost of HMA (2-inch), CSTC (2-inch), and CSBC (4-inch).
Cost of pipe installation includes structure excavation and shoring.
Cost of catch basin installation includes structure excavation and shoring.



Parametrix

N

0 75 150

Feet

- Discharge Point
- Control Structure
- Catchment
- WQ Facility
- Open Channel
- Storm Main

Capital Project and Rank

- High
- Medium
- Low
- Proposed Drain Pipe
- Proposed Catch Basin

- Streams
- 100 Year Flood
- Drainage Basin
- City Limits

Capital Project 25B.
KDM/16th Avenue (228th to KDM Rd) Pipe Project

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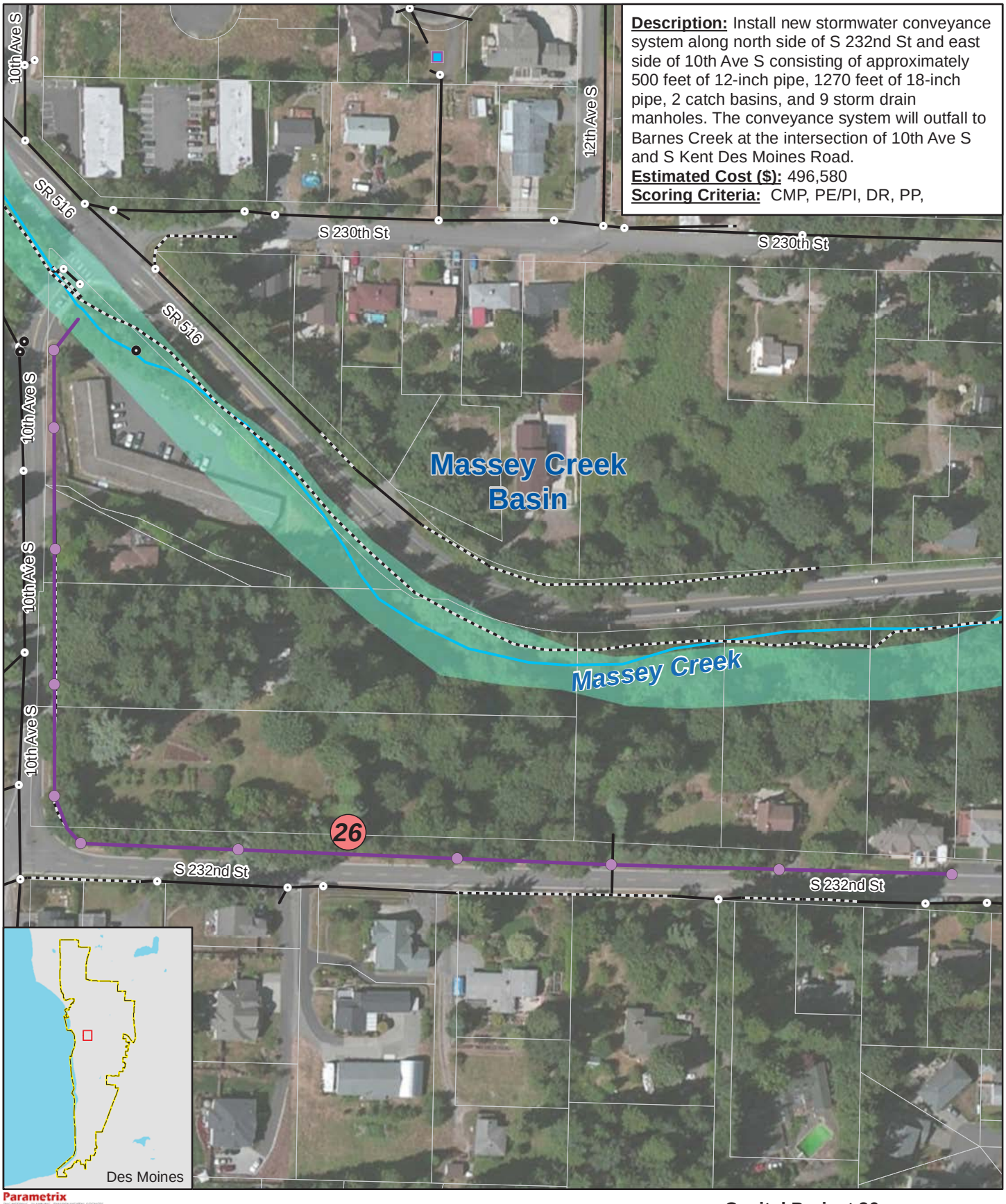
Capital Project 25B
Project Name: KDM/16th Avenue (228th to KDM) Pipe Project
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:

New 12" SD on W side of 16th Ave S. Install 2-foot paved shoulder and new CBs at pavement edge.
Install new 36" SD along N side of S Kent-Des Moines Rd. Connect to Type II CB (installed with CIP-25A), cross 16th Ave S, and replace roadside roadside ditches along KDM Rd. Install new CBs and curb and gutter at edge of existing pavement. Outfall 36" pipe to Barnes Creek.

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	$32,100	$32,100
2	1	LS	Traffic Control	$6,200	$6,200
3	1	LS	Erosion/Sedimentation Control	$6,200	$6,200
4	2155	LF	Pavement Restoration	$20	$43,100
5	1220	LF	Schedule A Storm Sewer Pipe, 12-Inch Diameter	$60	$73,200
6	935	LF	Schedule A Storm Sewer Pipe, 36-Inch Diameter	$140	$130,900
7	6	EA	Catch Basin Type I	$1,930	$11,580
8	1	EA	Catch Basin Type II, 48" Diam.	$4,880	$4,880
9	8	EA	Catch Basin Type II, 60" Diam.	$5,660	$45,280
10					

Construction Subtotal (2014 Dollars) =		$353,440
Inflation from 2014 to 2015	3.65%	$12,901
Construction Subtotal (2015 Dollars) =		**$366,341**
Contingency	30.0%	$109,902
Sales Tax	9.3%	$34,070
Planning Level Construction Cost =		**$510,300**
Environmental Permitting and Documentation	5.0%	$25,515
Administration	5.0%	$25,515
Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	$153,090
2015 TOTAL =		**$714,420**

ASSUMPTIONS:
Length of pipe, pipe diameter, number of structures and structure size were provided by City of Des Moines.
Mobilization equals approximately 10-percent of Subtotal.
Traffic Control equals approximately 2-percent of Subtotal.
Erosion/Sedimentation Control equals approximately 2-percent of Subtotal ($1,000 min).
Pavement Restoration includes the cost of HMA (2-inch), CSTC (2-inch), and CSBC (4-inch).
Cost of pipe installation includes structure excavation and shoring.
Cost of catch basin installation includes structure excavation and shoring.



Description: Install new stormwater conveyance system along north side of S 232nd St and east side of 10th Ave S consisting of approximately 500 feet of 12-inch pipe, 1270 feet of 18-inch pipe, 2 catch basins, and 9 storm drain manholes. The conveyance system will outfall to Barnes Creek at the intersection of 10th Ave S and S Kent Des Moines Road.
Estimated Cost ($): 496,580
Scoring Criteria: CMP, PE/PI, DR, PP,

Parametrix

N

0 60 120

Feet

- Discharge Point
- Control Structure
- Catchment
- WQ Facility
- Open Channel
- Storm Main

Capital Project and Rank

- High
- Medium
- Low
- Proposed Drain Pipe
- Proposed Catch Basin

- Streams
- 100 Year Flood
- Drainage Basin
- City Limits

Capital Project 26.
232nd Street (10th to 14th) Pipe Project

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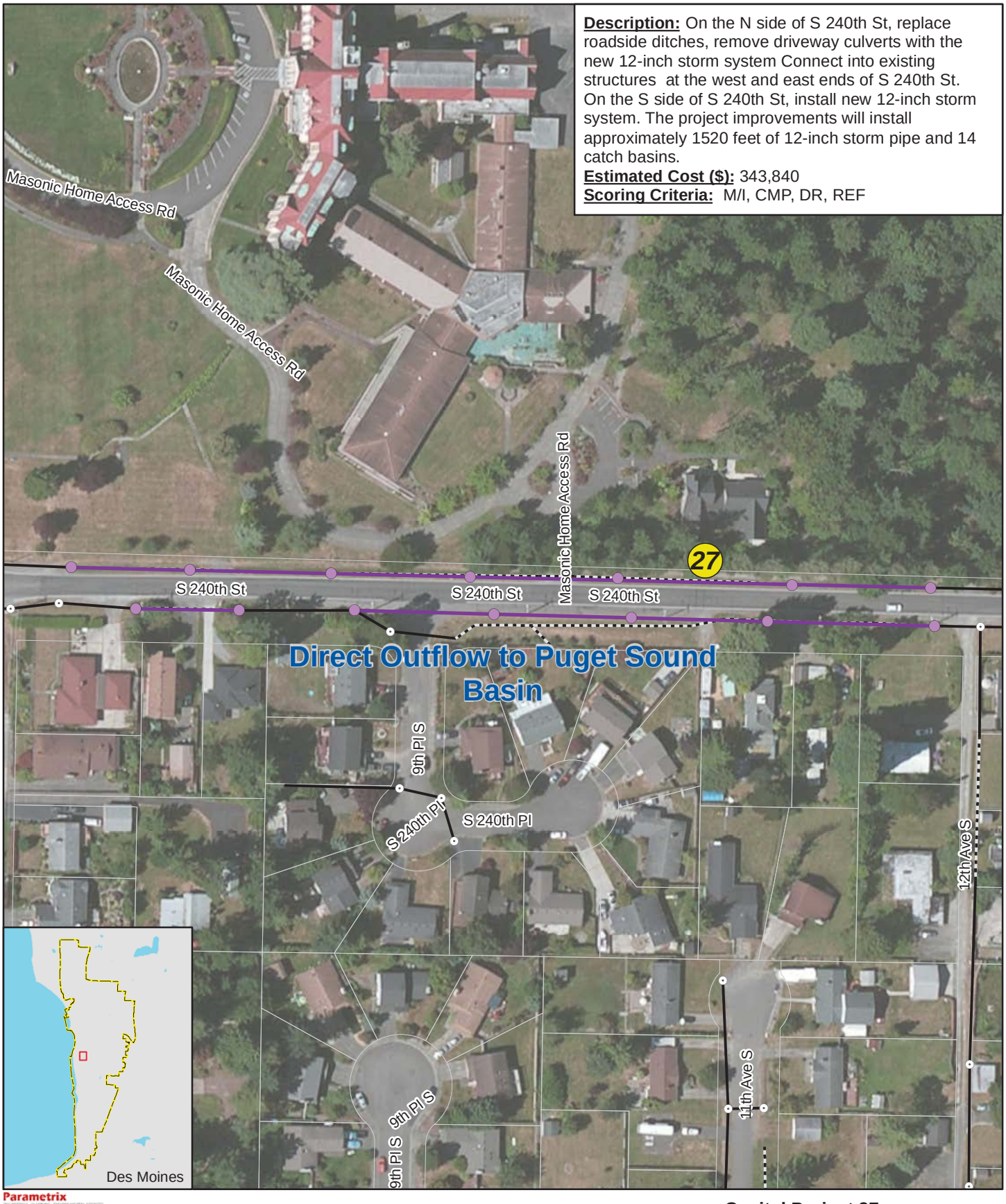
2015 Comprehensive Stormwater Plan Update
Preliminary Opinion of Probable Cost

Capital Project 26
Project Name: 232nd Street (10th to 14th) Pipe Project
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:
Install new SD system, 2-foot paved shoulder, and curb along north side of S 232nd St and east side of 10th Ave S. 18" pipe shall outfall to Barnes Creek at the intersection of 10th Ave S and S Kent Des Moines Road.

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	$22,300	$22,300
2	1	LS	Traffic Control	$4,300	$4,300
3	1	LS	Erosion/Sedimentation Control	$4,300	$4,300
4	1770	LF	Pavement Restoration	$20	$35,400
5	500	LF	Schedule A Storm Sewer Pipe, 12-Inch Diameter	$60	$30,000
6	1270	LF	Schedule A Storm Sewer Pipe, 18-Inch Diameter	$80	$101,600
7	2	EA	Catch Basin Type I	$1,930	$3,860
8	9	EA	Catch Basin Type II, 48" Diam.	$4,880	$43,920
9					
10					
			Construction Subtotal (2014 Dollars) =		$245,680
			Inflation from 2014 to 2015	3.65%	$8,967
			Construction Subtotal (2015 Dollars) =		**$254,647**
			Contingency	30.0%	$76,394
			Sales Tax	9.3%	$23,682
			Planning Level Construction Cost =		**$354,700**
			Environmental Permitting and Documentation	5.0%	$17,735
			Administration	5.0%	$17,735
			Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	$106,410
			2015 TOTAL =		**$496,580**

ASSUMPTIONS:
Length of pipe, pipe diameter, number of structures and structure size were provided by City of Des Moines.
Mobilization equals approximately 10-percent of Subtotal.
Traffic Control equals approximately 2-percent of Subtotal.
Erosion/Sedimentation Control equals approximately 2-percent of Subtotal ($1,000 min).
Pavement Restoration includes the cost of HMA (2-inch), CSTC (2-inch), and CSBC (4-inch).
Cost of pipe installation includes structure excavation and shoring.
Cost of catch basin installation includes structure excavation and shoring.



Description: On the N side of S 240th St, replace roadside ditches, remove driveway culverts with the new 12-inch storm system Connect into existing structures at the west and east ends of S 240th St. On the S side of S 240th St, install new 12-inch storm system. The project improvements will install approximately 1520 feet of 12-inch storm pipe and 14 catch basins.
Estimated Cost ($): 343,840
Scoring Criteria: M/I, CMP, DR, REF

Parametrix

N
0 50 100
Feet

- Discharge Point
- Control Structure
- Catchment
- WQ Facility
- Open Channel
- Storm Main

Capital Project and Rank
- High
- Medium
- Low
- Proposed Drain Pipe
- Proposed Catch Basin

- Streams
- 100 Year Flood
- Drainage Basin
- City Limits

Capital Project 27.
240th Street (MVD to 11th Place) Pipe Project

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Surface Water Comprehensive Plan

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Preliminary Opinion of Probable Cost

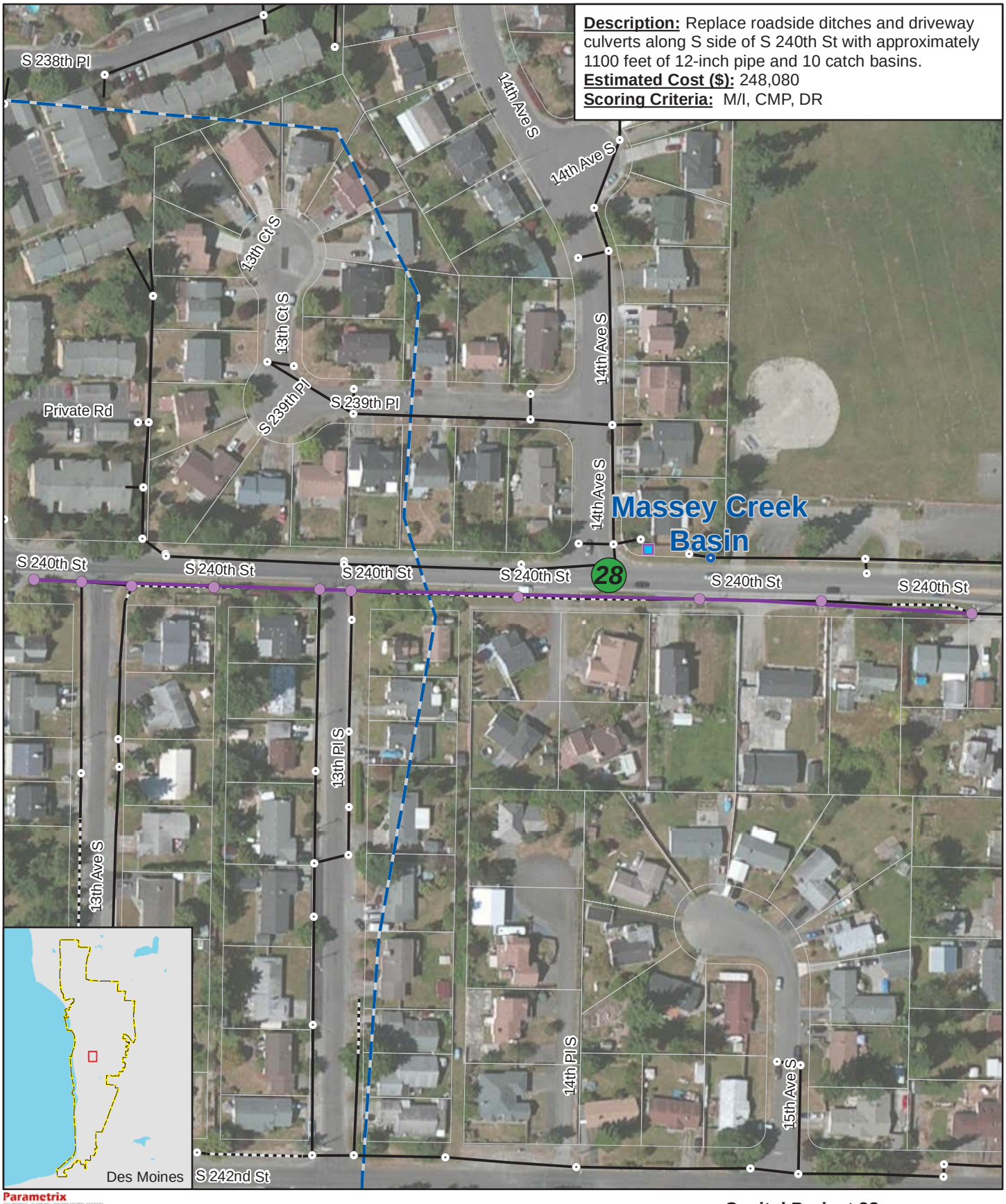
Capital Project 27
Project Name: 240th Street (MVD to 11th Place) Pipe Project
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:

N side of S 240th St: Pipe to replace roadside ditches. Install 2-foot shoulder and curb and CBs at new pavement edge. Remove driveway culverts. Tie into existing structures at the west and east ends of S 240th St.
S side of S 240th St: Install new SD system. Install curb and CBs at edge of existing pavement (ex pavement spans approx. 425 feet). The remainder of the improvements will require a new 2-foot shoulder and curb for CB installation.

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	$15,500	$15,500
2	1	LS	Traffic Control	$3,000	$3,000
3	1	LS	Erosion/Sedimentation Control	$3,000	$3,000
4	1520	LF	Pavement Restoration	$20	$30,400
5	1520	LF	Schedule A Storm Sewer Pipe, 12-Inch Diameter	$60	$91,200
6	14	EA	Catch Basin Type I	$1,930	$27,020
7					
8					
9					
10					

Construction Subtotal (2014 Dollars) =		$170,120
Inflation from 2014 to 2015	3.65%	$6,209
Construction Subtotal (2015 Dollars) =		**$176,329**
Contingency	30.0%	$52,899
Sales Tax	9.3%	$16,399
Planning Level Construction Cost =		**$245,600**
Environmental Permitting and Documentation	5.0%	$12,280
Administration	5.0%	$12,280
Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	$73,680
2015 TOTAL =		**$343,840**

ASSUMPTIONS:
Length of pipe, pipe diameter, number of structures and structure size were provided by City of Des Moines.
Mobilization equals approximately 10-percent of Subtotal.
Traffic Control equals approximately 2-percent of Subtotal.
Erosion/Sedimentation Control equals approximately 2-percent of Subtotal ($1,000 min).
Pavement Restoration includes the cost of HMA (2-inch), CSTC (2-inch), and CSBC (4-inch).
Cost of pipe installation includes structure excavation and shoring.
Cost of catch basin installation includes structure excavation and shoring.



Parametrix

N

0 60 120

Feet

- Discharge Point
- Control Structure
- Catchment
- WQ Facility
- Open Channel
- Storm Main

Capital Project and Rank

- High
- Medium
- Low
- Proposed Drain Pipe
- Proposed Catch Basin

- Streams
- 100 Year Flood
- Drainage Basin
- City Limits

Capital Project 28.
240th Street (13th to 16th Ave)
Pipe Project

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Capital Project 28
Project Name: 240th Street (13th to 16th Ave) Pipe Project
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:
Pipe to replace roadside ditches and driveway culverts along S side of S 240th St. Add 2-foot of paved shoulder and curb, and install CB's at pavement edge.

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	$11,200	$11,200
2	1	LS	Traffic Control	$2,100	$2,100
3	1	LS	Erosion/Sedimentation Control	$2,100	$2,100
4	1100	LF	Pavement Restoration	$20	$22,000
5	1100	LF	Schedule A Storm Sewer Pipe, 12-Inch Diameter	$60	$66,000
6	10	EA	Catch Basin Type I	$1,930	$19,300
7					
8					
9					
10					
			Construction Subtotal (2014 Dollars) =		$122,700
			Inflation from 2014 to 2015	3.65%	$4,479
			Construction Subtotal (2015 Dollars) =		**$127,179**
			Contingency	30.0%	$38,154
			Sales Tax	9.3%	$11,828
			Planning Level Construction Cost =		**$177,200**
			Environmental Permitting and Documentation	5.0%	$8,860
			Administration	5.0%	$8,860
			Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	$53,160
			2015 TOTAL =		**$248,080**

ASSUMPTIONS:
Length of pipe, pipe diameter, number of structures and structure size were provided by City of Des Moines.
Mobilization equals approximately 10-percent of Subtotal.
Traffic Control equals approximately 2-percent of Subtotal.
Erosion/Sedimentation Control equals approximately 2-percent of Subtotal ($1,000 min).
Pavement Restoration includes the cost of HMA (2-inch), CSTC (2-inch), and CSBC (4-inch).
Cost of pipe installation includes structure excavation and shoring.
Cost of catch basin installation includes structure excavation and shoring.

Capital Project 29.
25th Avenue (n/o 232nd Street)
Pipe Replacement Project

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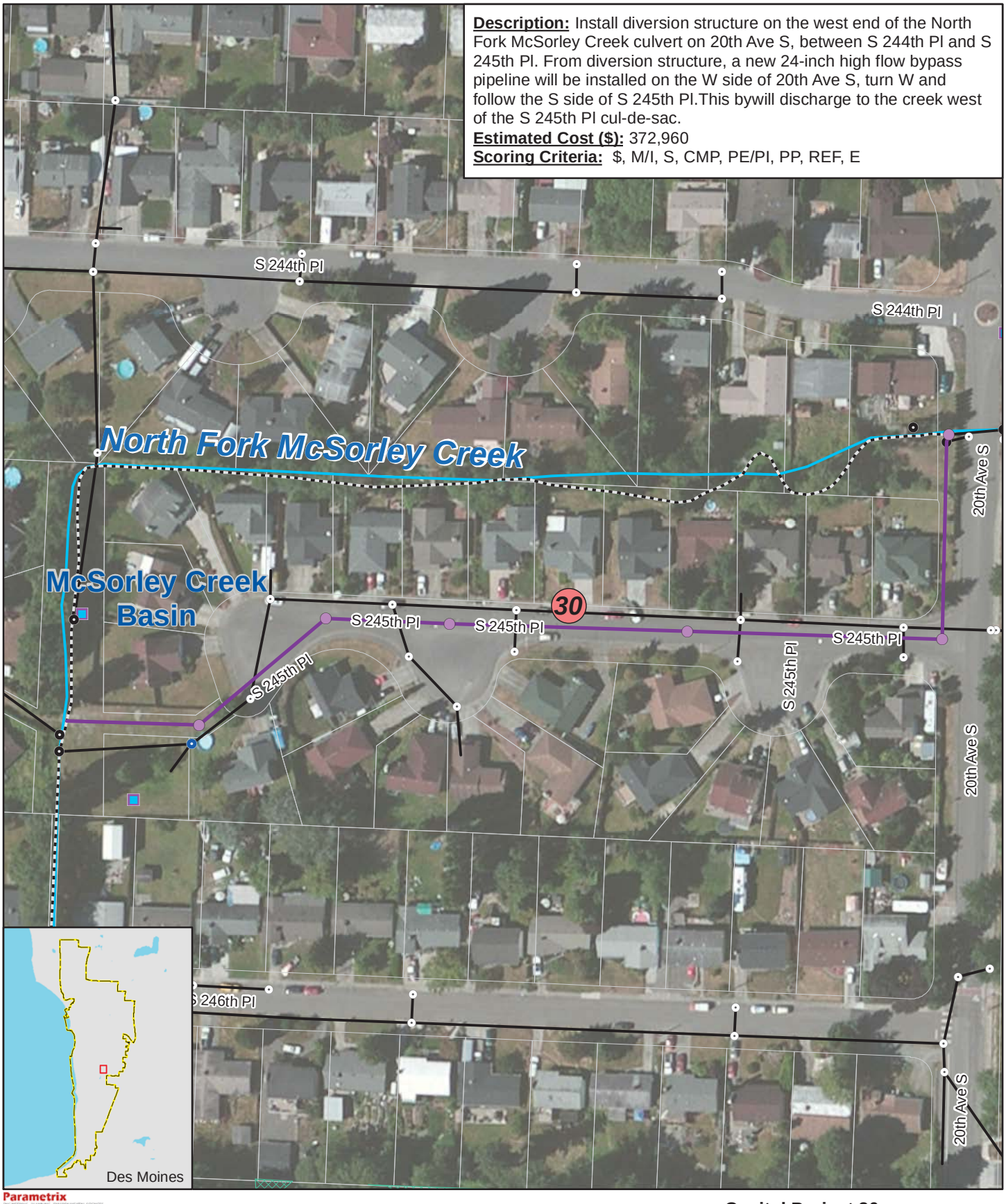
Capital Project 29
Project Name: 25th Avenue (n/o 232nd Street) Pipe Replacement Project
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:
Pipe to replace roadside ditches and driveway culverts along W side of 25th Ave S. North end of project outfalls to creek (name unknown). South end crosses 232nd St, where existing CB will be replaced with Type 2 CB. Install curb and CBs along edge of existing pavement.

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	$4,500	$4,500
2	1	LS	Traffic Control	$900	$900
3	1	LS	Erosion/Sedimentation Control	$900	$900
4	380	LF	Pavement Restoration	$20	$7,600
5	380	LF	Schedule A Storm Sewer Pipe, 12-Inch Diameter	$60	$22,800
6	4	EA	Catch Basin Type I	$1,930	$7,720
7	1	EA	Catch Basin Type II, 48" Diam.	$4,880	$4,880
8					
9					
10					
			Construction Subtotal (2014 Dollars) =		$49,300
			Inflation from 2014 to 2015	3.65%	$1,799
			Construction Subtotal (2015 Dollars) =		**$51,099**
			Contingency	30.0%	$15,330
			Sales Tax	9.3%	$4,752
			Planning Level Construction Cost =		**$71,200**
			Environmental Permitting and Documentation	5.0%	$3,560
			Administration	5.0%	$3,560
			Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	$21,360
			2015 TOTAL =		**$99,680**

ASSUMPTIONS:
Length of pipe, pipe diameter, number of structures and structure size were provided by City of Des Moines.
Mobilization equals approximately 10-percent of Subtotal.
Traffic Control equals approximately 2-percent of Subtotal.
Erosion/Sedimentation Control equals approximately 2-percent of Subtotal ($1,000 min).
Pavement Restoration includes the cost of HMA (2-inch), CSTC (2-inch), and CSBC (4-inch).
Cost of pipe installation includes structure excavation and shoring.
Cost of catch basin installation includes structure excavation and shoring.



Parametrix

Discharge Point
Control Structure
Catchment
WQ Facility
Open Channel
Storm Main

Capital Project and Rank
High
Medium
Low
Proposed Drain Pipe
Proposed Catch Basin

Streams
100 Year Flood
Drainage Basin
City Limits

N
0 50 100
Feet

Capital Project 30.
North Fork McSorley Creek Diversion Project

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Capital Project 30
Project Name: North Fork McSorley Creek Diversion Project
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:

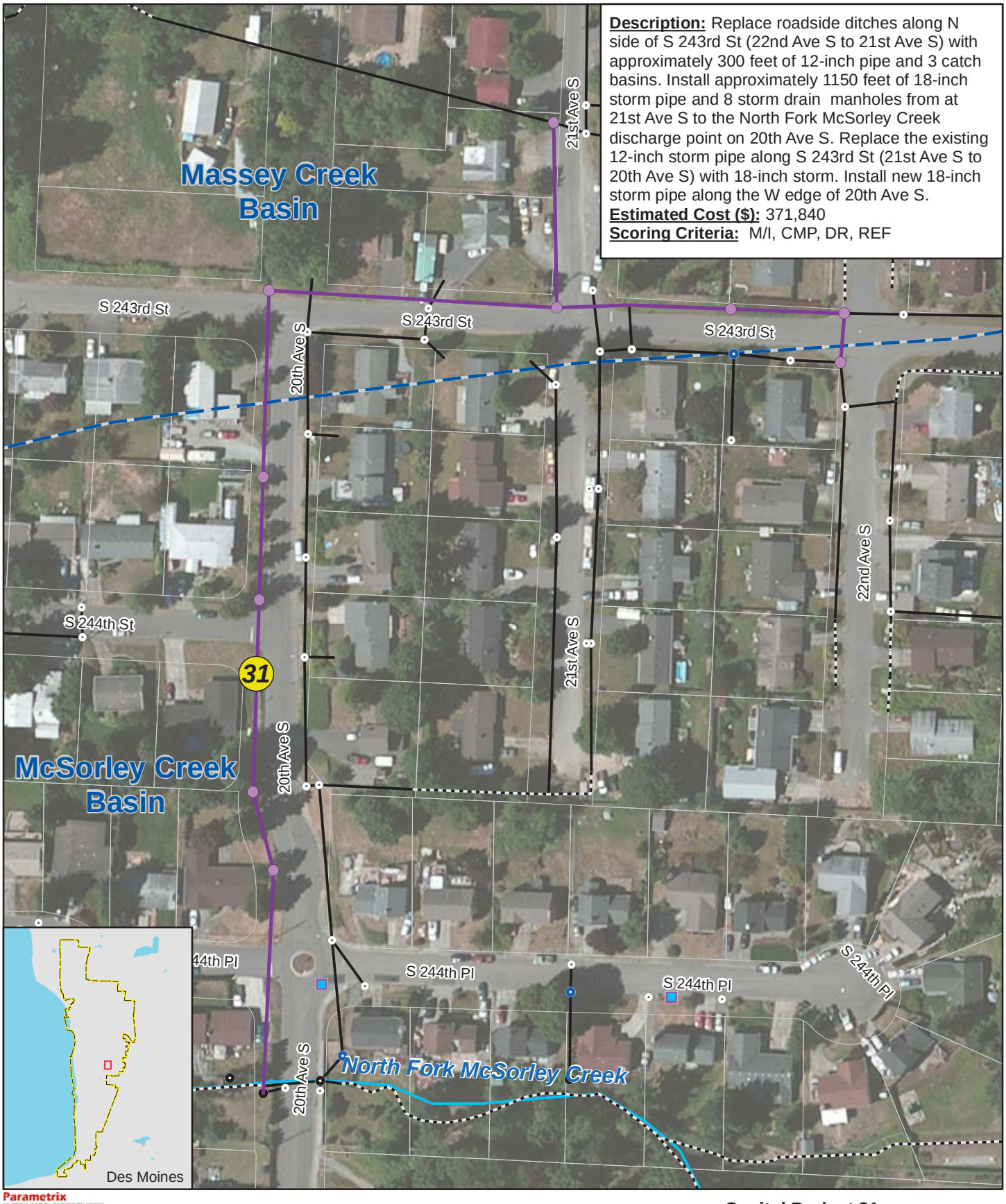
Install diversion structure on 20th Ave S, between S 244th Pl and S 245th Pl. From diversion structure, new 24" SD will run on the W side of 20th Ave S, turn W and follow the S side of S 245th Pl. Replace C&G along 20th Ave S, and C&G and sidewalk along S 245th Pl. At the end of S 245th Pl, pipe veers SW and follows King County property until it outfalls to McSorley Creek.

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	$16,800	$16,800
2	1	LS	Traffic Control	$3,200	$3,200
3	1	LS	Erosion/Sedimentation Control	$3,200	$3,200
4	1100	LF	Pavement Restoration	$20	$22,000
5	1100	LF	Schedule A Storm Sewer Pipe, 24-Inch Diameter	$100	$110,000
6	6	EA	Catch Basin Type II, 48" Diam.	$4,880	$29,280
7					
8					
9					
10					

Construction Subtotal (2014 Dollars) =		$184,480
Inflation from 2014 to 2015	3.65%	$6,734
Construction Subtotal (2015 Dollars) =		**$191,214**
Contingency	30.0%	$57,364
Sales Tax	9.3%	$17,783
Planning Level Construction Cost =		**$266,400**
Environmental Permitting and Documentation	5.0%	$13,320
Administration	5.0%	$13,320
Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	$79,920
2015 TOTAL =		**$372,960**

ASSUMPTIONS:

Length of pipe, pipe diameter, number of structures and structure size were provided by City of Des Moines.
Mobilization equals approximately 10-percent of Subtotal.
Traffic Control equals approximately 2-percent of Subtotal.
Erosion/Sedimentation Control equals approximately 2-percent of Subtotal ($1,000 min).
Pavement Restoration includes the cost of HMA (2-inch), CSTC (2-inch), and CSBC (4-inch).
Cost of pipe installation includes structure excavation and shoring.
Cost of catch basin installation includes structure excavation and shoring.



Capital Project 31.
20th Avenue/243rd Street Pipe Upgrade

City of Des Moines
Surface Water Comprehensive Plan

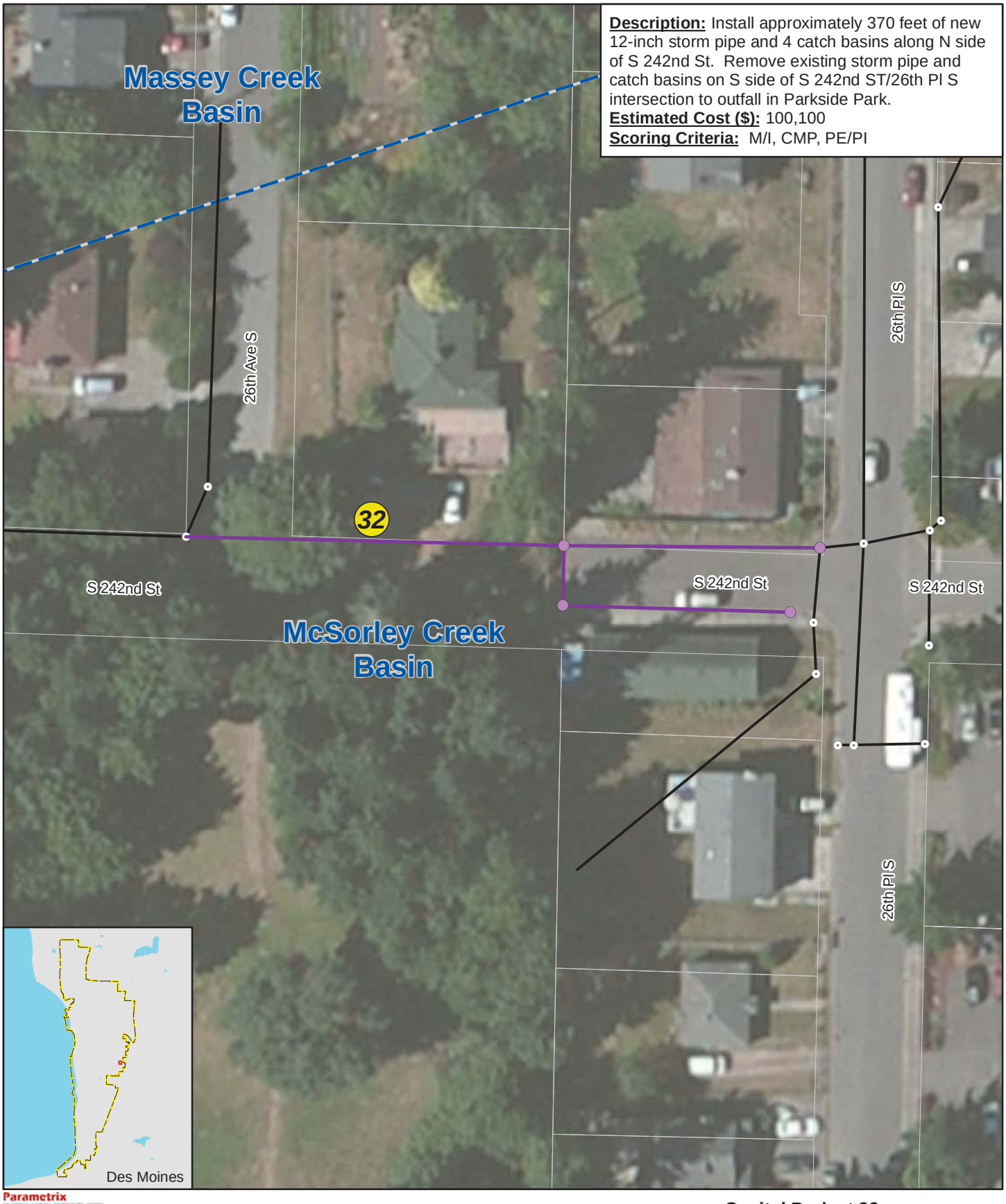
CITY OF DES MOINES
2015 Comprehensive Stormwater Plan Update
Preliminary Opinion of Probable Cost

Capital Project 31
Project Name: 20th Avenue/243rd Street Pipe Upgrade
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:

New 12" SD to replace roadside ditches along N side of S 243rd St (22nd Ave S to 21st Ave S). Install 2-foot paved shoulder, curb, and CBs at pavement edge. Pipe size increases to 18" at 21st Ave S. Remove ex SD pipe and CB along S 243rd St (21st Ave S to 20th Ave S). Replace wedge curb with curb and gutter and install CB at edge of pavement. 18" pipe turns south and runs along W edge of 20th Ave S. Install CBs along edge of pavement and replace C&G as required.

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	$16,700	$16,700
2	1	LS	Traffic Control	$3,200	$3,200
3	1	LS	Erosion/Sedimentation Control	$3,200	$3,200
4	300	LF	Pavement Restoration	$20	$6,000
5	300	LF	Schedule A Storm Sewer Pipe, 12-Inch Diameter	$60	$18,000
6	1150	LF	Schedule A Storm Sewer Pipe, 18-Inch Diameter	$80	$92,000
7	3	EA	Catch Basin Type I	$1,930	$5,790
8	8	EA	Catch Basin Type II, 48" Diam.	$4,880	$39,040
9					
10					
			Construction Subtotal (2014 Dollars) =		$183,930
			Inflation from 2014 to 2015	3.65%	$6,713
			Construction Subtotal (2015 Dollars) =		**$190,643**
			Contingency	30.0%	$57,193
			Sales Tax	9.3%	$17,730
			Planning Level Construction Cost =		**$265,600**
			Environmental Permitting and Documentation	5.0%	$13,280
			Administration	5.0%	$13,280
			Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	$79,680
			2015 TOTAL =		**$371,840**

ASSUMPTIONS:
Length of pipe, pipe diameter, number of structures and structure size were provided by City of Des Moines.
Mobilization equals approximately 10-percent of Subtotal.
Traffic Control equals approximately 2-percent of Subtotal.
Erosion/Sedimentation Control equals approximately 2-percent of Subtotal ($1,000 min).
Pavement Restoration includes the cost of HMA (2-inch), CSTC (2-inch), and CSBC (4-inch).
Cost of pipe installation includes structure excavation and shoring.
Cost of catch basin installation includes structure excavation and shoring.



Description: Install approximately 370 feet of new 12-inch storm pipe and 4 catch basins along N side of S 242nd St. Remove existing storm pipe and catch basins on S side of S 242nd ST/26th Pl S intersection to outfall in Parkside Park.
Estimated Cost ($): 100,100
Scoring Criteria: M/I, CMP, PE/PI

Parametrix

N

0 20 40
Feet

- Discharge Point
- Control Structure
- Catchment
- WQ Facility
- Open Channel
- Storm Main

Capital Project and Rank
- High
- Medium
- Low
- Proposed Drain Pipe
- Proposed Catch Basin

- Streams
- 100 Year Flood
- Drainage Basin
- City Limits

Capital Project 32.
242nd Street (26th Ave to 26th Pl) Pipe Project

City of Des Moines
Surface Water Comprehensive Plan

CITY OF DES MOINES
2015 Comprehensive Stormwater Plan Update
Preliminary Opinion of Probable Cost

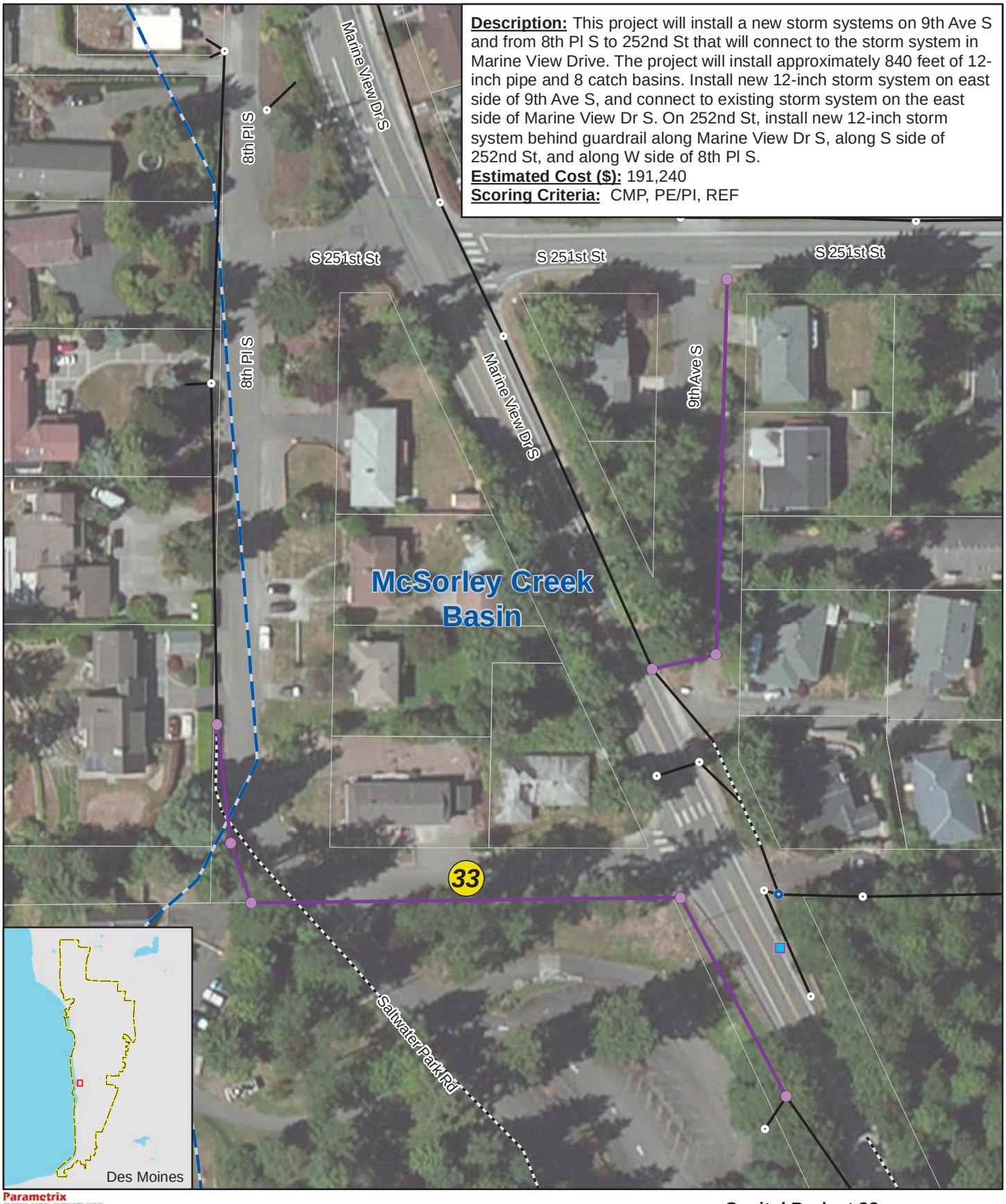
Capital Project 32
Project Name: 242nd Street (26th Ave to 26th Pl) Pipe Project
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:

Install 12" SD along N side of S 242nd St. Remove vegetation to install pipe in wooded area. Replace approx. 112 LF of sidewalk, curb and gutter on S 242nd St (east of road divide). Install new curb along north side of S 242nd St (east of road divide). Remove ex pipe from CB on S side of S 242nd ST/26th Pl S intersection to outfall in Parkside Park.

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	$4,500	$4,500
2	1	LS	Traffic Control	$900	$900
3	1	LS	Erosion/Sedimentation Control	$900	$900
4	370	LF	Pavement Restoration	$20	$7,400
5	370	LF	Schedule A Storm Sewer Pipe, 12-Inch Diameter	$60	$22,200
6	2	EA	Catch Basin Type I	$1,930	$3,860
7	2	EA	Catch Basin Type II, 48" Diam.	$4,880	$9,760
8					
9					
10					
			Construction Subtotal (2014 Dollars) =		$49,520
			Inflation from 2014 to 2015	3.65%	$1,807
			Construction Subtotal (2015 Dollars) =		**$51,327**
			Contingency	30.0%	$15,398
			Sales Tax	9.3%	$4,773
			Planning Level Construction Cost =		**$71,500**
			Environmental Permitting and Documentation	5.0%	$3,575
			Administration	5.0%	$3,575
			Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	$21,450
			2015 TOTAL =		**$100,100**

ASSUMPTIONS:

Length of pipe, pipe diameter, number of structures and structure size were provided by City of Des Moines.
Mobilization equals approximately 10-percent of Subtotal.
Traffic Control equals approximately 2-percent of Subtotal.
Erosion/Sedimentation Control equals approximately 2-percent of Subtotal ($1,000 min).
Pavement Restoration includes the cost of HMA (2-inch), CSTC (2-inch), and CSBC (4-inch).
Cost of pipe installation includes structure excavation and shoring.
Cost of catch basin installation includes structure excavation and shoring.



Parametrix

N

0 40 80

Feet

- Discharge Point
- Control Structure
- Catchment
- WQ Facility
- Open Channel
- Storm Main

Capital Project and Rank

- High
- Medium
- Low
- Proposed Drain Pipe
- Proposed Catch Basin

- Streams
- 100 Year Flood
- Drainage Basin
- City Limits

Capital Project 33.
252nd Street/9th Avenue Pipe Project

City of Des Moines
Surface Water Comprehensive Plan

CITY OF DES MOINES
2015 Comprehensive Stormwater Plan Update
Preliminary Opinion of Probable Cost

Capital Project 33
Project Name: 252nd Street/9th Avenue Pipe Project
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:
9th Ave: New 12" SD on east side of 9th Ave S. Pipe turns west to connect into ex SD on Marine View Dr S. Vegetation removal may be required for this stretch of pipe. Replace ex CB, sidewalk, and C&G at connection.
252nd St: Install new 12" SD behind guardrail along Marine View Dr S, along S side of 252nd St, and along W side of 8th Pl S.

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	$8,600	$8,600
2	1	LS	Traffic Control	$1,700	$1,700
3	1	LS	Erosion/Sedimentation Control	$1,700	$1,700
4	840	LF	Pavement Restoration	$20	$16,800
5	840	LF	Schedule A Storm Sewer Pipe, 12-Inch Diameter	$60	$50,400
6	8	EA	Catch Basin Type I	$1,930	$15,440
7					
8					
9					
10					

Construction Subtotal (2014 Dollars) =		$94,640
Inflation from 2014 to 2015	3.65%	$3,454
Construction Subtotal (2015 Dollars) =		**$98,094**
Contingency	30.0%	$29,428
Sales Tax	9.3%	$9,123
Planning Level Construction Cost =		**$136,600**
Environmental Permitting and Documentation	5.0%	$6,830
Administration	5.0%	$6,830
Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	$40,980
2015 TOTAL =		**$191,240**

ASSUMPTIONS:
Length of pipe, pipe diameter, number of structures and structure size were provided by City of Des Moines.
Mobilization equals approximately 10-percent of Subtotal.
Traffic Control equals approximately 2-percent of Subtotal.
Erosion/Sedimentation Control equals approximately 2-percent of Subtotal ($1,000 min).
Pavement Restoration includes the cost of HMA (2-inch), CSTC (2-inch), and CSBC (4-inch).
Cost of pipe installation includes structure excavation and shoring.
Cost of catch basin installation includes structure excavation and shoring.

Parametrix

N

0 60 120

Feet

- Discharge Point
- Control Structure
- Catchment
- WQ Facility
- Open Channel
- Storm Main

Capital Project and Rank

- High
- Medium
- Low
- Proposed Drain Pipe
- Proposed Catch Basin

- Streams
- 100 Year Flood
- Drainage Basin
- City Limits

Capital Project 34.
258th Street (13th Pl to 16th Ave) Pipe Project

City of Des Moines
Surface Water Comprehensive Plan

CITY OF DES MOINES
2015 Comprehensive Stormwater Plan Update
Preliminary Opinion of Probable Cost

Capital Project 34
Project Name: 258th Street (13th Pl to 16th Ave) Pipe Project
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:

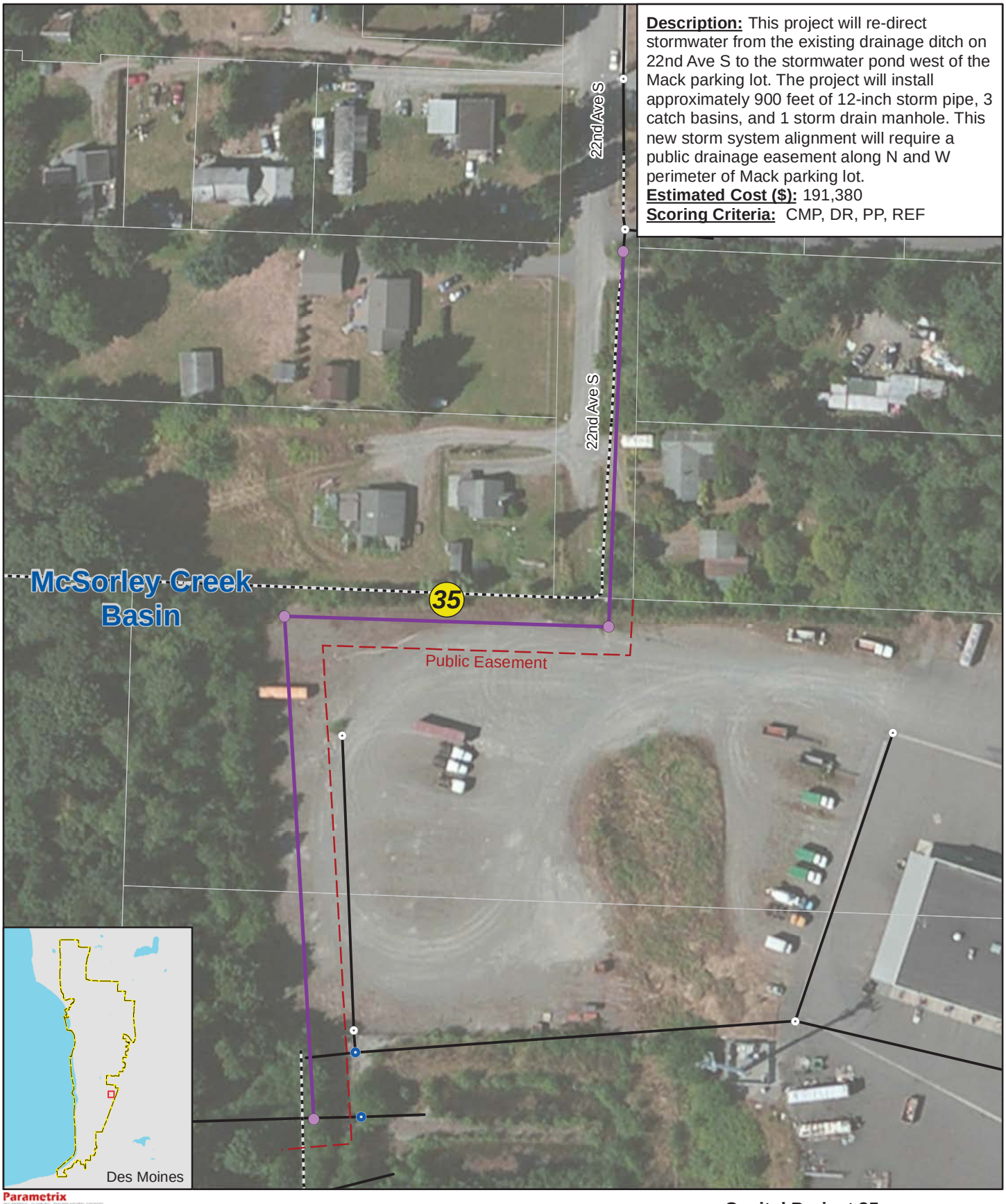
Replace roadside ditches along S side of S 258th St with 18" HDPE pipe. Install 2' shoulder, curb, and CBs at pavement edge. Remove ex driveway culverts. New pipe leaves roadway just east of 14th Ln S and extends through private property. Pipe ends at new CB installed on W side of 16th Ave S. Drainage easements will be required for up to 12 properties (depending on pipe alignment)

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	$13,000	$13,000
2	1	LS	Traffic Control	$2,500	$2,500
3	1	LS	Erosion/Sedimentation Control	$2,500	$2,500
4	960	LF	Pavement Restoration	$20	$19,200
5	960	LF	Schedule A Storm Sewer Pipe, 18-Inch Diameter	$80	$76,800
6	6	EA	Catch Basin Type II, 48" Diam.	$4,880	$29,280
7					
8					
9					
10					

Construction Subtotal (2014 Dollars) =		$143,280
Inflation from 2014 to 2015	3.65%	$5,230
Construction Subtotal (2015 Dollars) =		**$148,510**
Property Acquisition/Easements	25.0%	$37,128
Contingency	30.0%	$44,553
Sales Tax	9.3%	$13,811
Planning Level Construction Cost =		**$244,000**
Environmental Permitting and Documentation	5.0%	$12,200
Administration	5.0%	$12,200
Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	$73,200
2015 TOTAL =		**$341,600**

ASSUMPTIONS:

Length of pipe, pipe diameter, number of structures and structure size were provided by City of Des Moines.
Mobilization equals approximately 10-percent of Subtotal.
Traffic Control equals approximately 2-percent of Subtotal.
Erosion/Sedimentation Control equals approximately 2-percent of Subtotal ($1,000 min).
Pavement Restoration includes the cost of HMA (2-inch), CSTC (2-inch), and CSBC (4-inch).
Cost of pipe installation includes structure excavation and shoring.
Cost of catch basin installation includes structure excavation and shoring.



Description: This project will re-direct stormwater from the existing drainage ditch on 22nd Ave S to the stormwater pond west of the Mack parking lot. The project will install approximately 900 feet of 12-inch storm pipe, 3 catch basins, and 1 storm drain manhole. This new storm system alignment will require a public drainage easement along N and W perimeter of Mack parking lot.
Estimated Cost ($): 191,380
Scoring Criteria: CMP, DR, PP, REF

Parametrix

N

0 40 80
Feet

- Discharge Point
- Control Structure
- Catchment
- WQ Facility
- Open Channel
- Storm Main

Capital Project and Rank
- High
- Medium
- Low
- Proposed Drain Pipe
- Proposed Catch Basin

- Streams
- 100 Year Flood
- Drainage Basin
- City Limits

Capital Project 35.
22nd Avenue Outfall Project

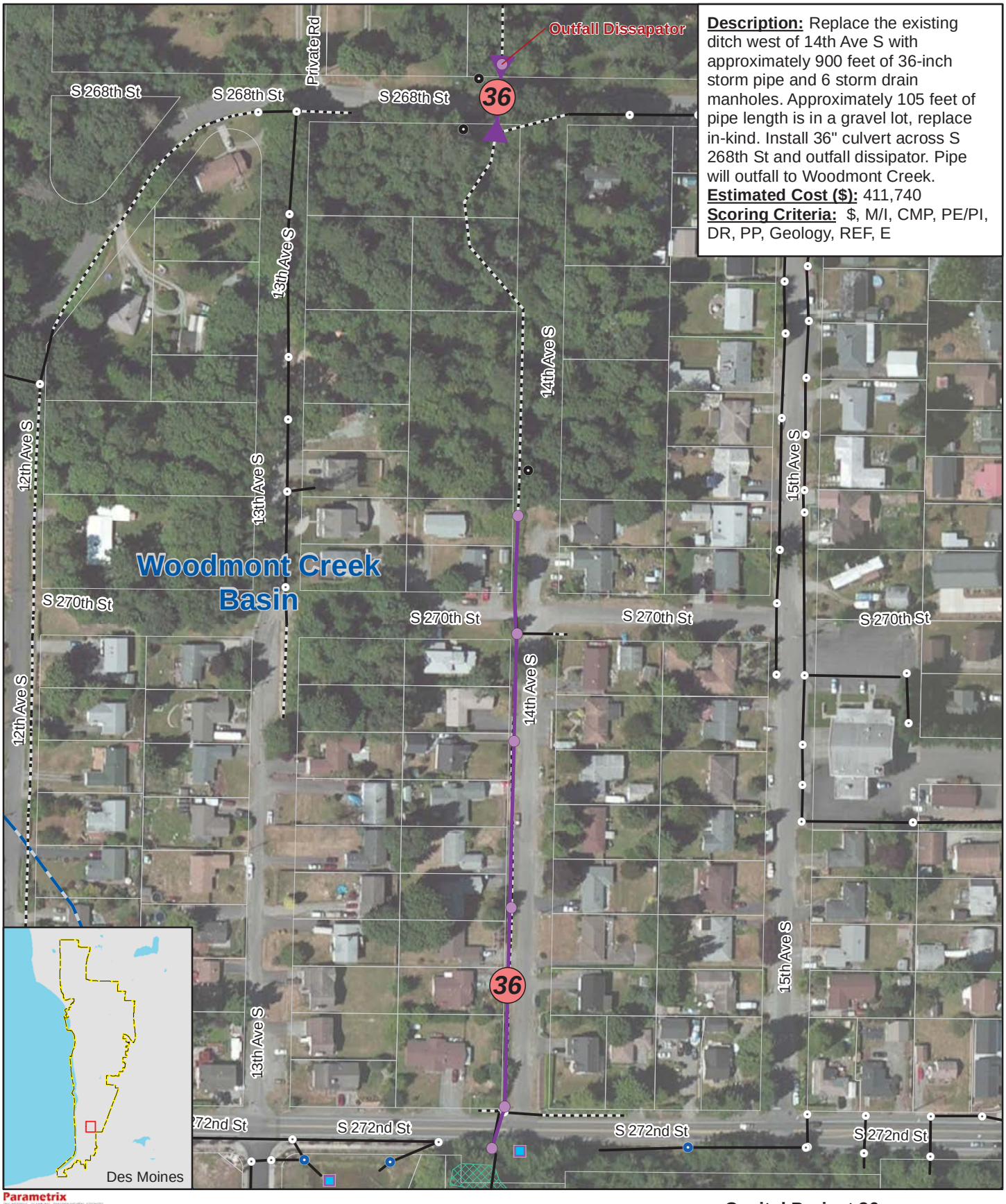
City of Des Moines
Surface Water Comprehensive Plan

CITY OF DES MOINES
2015 Comprehensive Stormwater Plan Update
Preliminary Opinion of Probable Cost

Capital Project 35
Project Name: 22nd Avenue Outfall Project
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:
Replace ex CB in 22nd Ave S and install 12" SD along E side of roadway. Pipe alignment runs east of roadside ditches. Public easement required for pipe installation along N and W perimeter of Mack parking lot. Pipe to outfall to existing SW pond.

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	$8,600	$8,600
2	1	LS	Traffic Control	$1,700	$1,700
3	1	LS	Erosion/Sedimentation Control	$1,700	$1,700
4	900	LF	Pavement Restoration	$20	$18,000
5	900	LF	Schedule A Storm Sewer Pipe, 12-Inch Diameter	$60	$54,000
6	3	EA	Catch Basin Type I	$1,930	$5,790
7	1	EA	Catch Basin Type II, 48" Diam.	$4,880	$4,880
8					
9					
10					
			Construction Subtotal (2014 Dollars) =		$94,670
			Inflation from 2014 to 2015	3.65%	$3,455
			Construction Subtotal (2015 Dollars) =		**$98,125**
			Contingency	30.0%	$29,438
			Sales Tax	9.3%	$9,126
			Planning Level Construction Cost =		**$136,700**
			Environmental Permitting and Documentation	5.0%	$6,835
			Administration	5.0%	$6,835
			Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	$41,010
			2015 TOTAL =		**$191,380**

ASSUMPTIONS:
Length of pipe, pipe diameter, number of structures and structure size were provided by City of Des Moines.
Mobilization equals approximately 10-percent of Subtotal.
Traffic Control equals approximately 2-percent of Subtotal.
Erosion/Sedimentation Control equals approximately 2-percent of Subtotal ($1,000 min).
Pavement Restoration includes the cost of HMA (2-inch), CSTC (2-inch), and CSBC (4-inch).
Cost of pipe installation includes structure excavation and shoring.
Cost of catch basin installation includes structure excavation and shoring.



Description: Replace the existing ditch west of 14th Ave S with approximately 900 feet of 36-inch storm pipe and 6 storm drain manholes. Approximately 105 feet of pipe length is in a gravel lot, replace in-kind. Install 36" culvert across S 268th St and outfall dissipator. Pipe will outfall to Woodmont Creek.
Estimated Cost ($): 411,740
Scoring Criteria: $, M/I, CMP, PE/PI, DR, PP, Geology, REF, E

Parametrix

N

0 75 150

Feet

- Discharge Point
- Control Structure
- Catchment
- WQ Facility
- Open Channel
- Storm Main

Capital Project and Rank

- High
- Medium
- Low
- Proposed Drain Pipe
- Proposed Culvert
- Proposed Catch Basin

- Streams
- 100 Year Flood
- Drainage Basin
- City Limits

Capital Project 36.
14th Avenue (268th to 272nd)
Pipe Upgrade

City of Des Moines
Surface Water Comprehensive Plan

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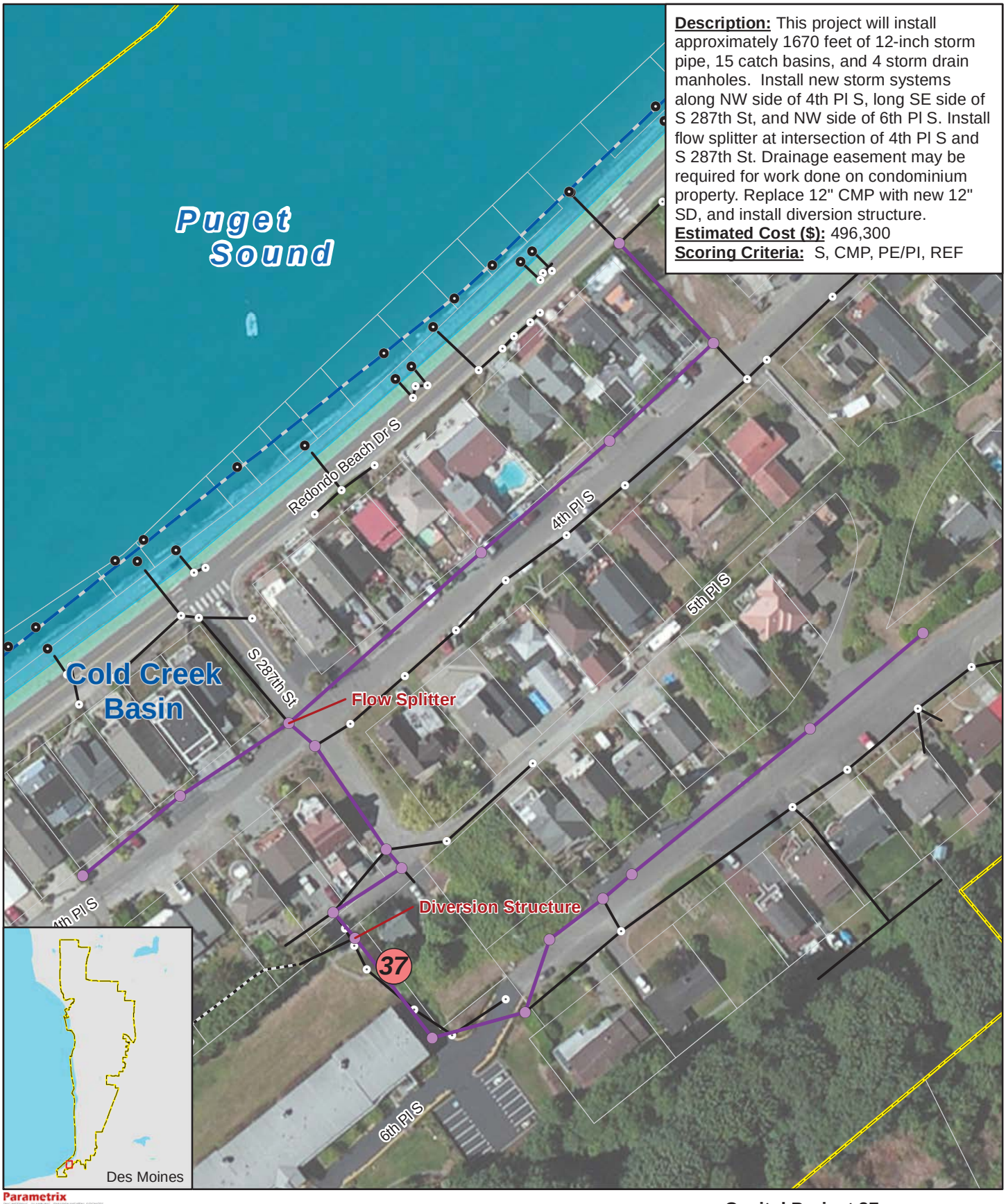
2015 Comprehensive Stormwater Plan Update
Preliminary Opinion of Probable Cost

Capital Project 36
Project Name: 14th Avenue(268th to 272nd) Pipe Upgrade
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:
New 36" SD along W side of 14th Ave S to replace roadside ditches. Install 2-foot paved shoulder, curb, and Type 2 CBs at pavement edge. Approx. 105 feet of pipe length is in a gravel lot, replace in-kind. Install 36" culvert across S 268th St and outfall dissipator. Pipe will outfall to creek (name unknown).

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	$18,500	$18,500
2	1	LS	Traffic Control	$3,600	$3,600
3	1	LS	Erosion/Sedimentation Control	$3,600	$3,600
4	900	LF	Pavement Restoration	$20	$18,000
5	900	LF	Schedule A Storm Sewer Pipe, 36-Inch Diameter	$140	$126,000
6	6	EA	Catch Basin Type II, 60" Diam.	$5,660	$33,960
7					
8					
9					
10					
			Construction Subtotal (2014 Dollars) =		$203,660
			Inflation from 2014 to 2015	3.65%	$7,434
			Construction Subtotal (2015 Dollars) =		**$211,094**
			Contingency	30.0%	$63,328
			Sales Tax	9.3%	$19,632
			Planning Level Construction Cost =		**$294,100**
			Environmental Permitting and Documentation	5.0%	$14,705
			Administration	5.0%	$14,705
			Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	$88,230
			2015 TOTAL =		**$411,740**

ASSUMPTIONS:
Length of pipe, pipe diameter, number of structures and structure size were provided by City of Des Moines.
Mobilization equals approximately 10-percent of Subtotal.
Traffic Control equals approximately 2-percent of Subtotal.
Erosion/Sedimentation Control equals approximately 2-percent of Subtotal ($1,000 min).
Pavement Restoration includes the cost of HMA (2-inch), CSTC (2-inch), and CSBC (4-inch).
Cost of pipe installation includes structure excavation and shoring.
Cost of catch basin installation includes structure excavation and shoring.



Description: This project will install approximately 1670 feet of 12-inch storm pipe, 15 catch basins, and 4 storm drain manholes. Install new storm systems along NW side of 4th Pl S, long SE side of S 287th St, and NW side of 6th Pl S. Install flow splitter at intersection of 4th Pl S and S 287th St. Drainage easement may be required for work done on condominium property. Replace 12" CMP with new 12" SD, and install diversion structure.
Estimated Cost ($): 496,300
Scoring Criteria: S, CMP, PE/PI, REF

Parametrix

N

0 50 100
Feet

- Discharge Point
- Control Structure
- Catchment
- WQ Facility
- Open Channel
- Storm Main

Capital Project and Rank
- High
- Medium
- Low
- Proposed Drain Pipe
- Proposed Catch Basin

- Streams
- 100 Year Flood
- Drainage Basin
- City Limits

Capital Project 37.
6th Place/287th Street Pipe Replacement Project

City of Des Moines
Surface Water Comprehensive Plan

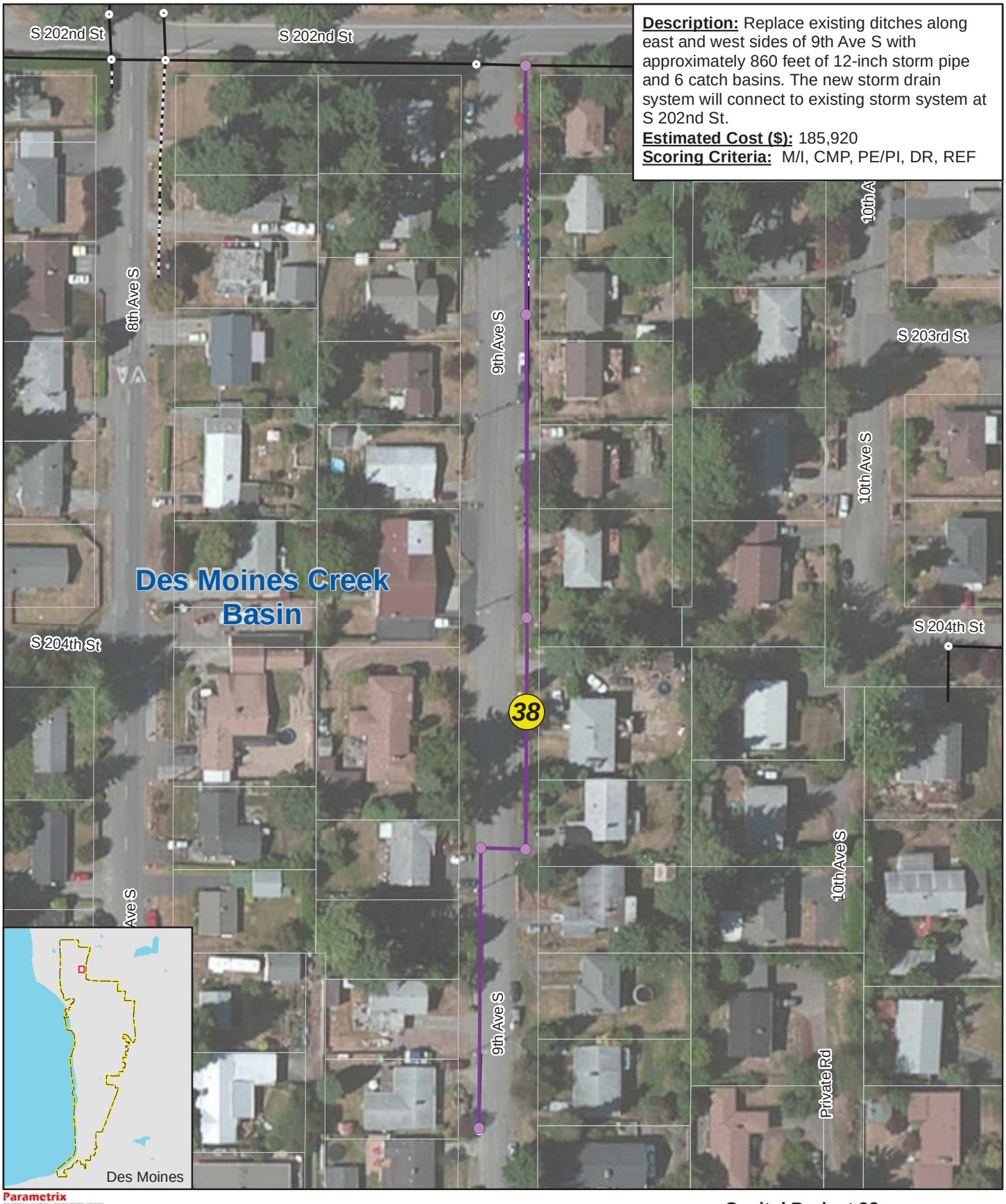
CITY OF DES MOINES
2015 Comprehensive Stormwater Plan Update
Preliminary Opinion of Probable Cost

Capital Project 37
Project Name: 6th Place/287th Street Pipe Replacement Project
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:

4th Pl S: New SD along NW side of roadway. Install new CBs at pavement edge. Install splitter at intersection of 4th Pl S and S 287th St.
S 287th St: New SD along SE side of S 287th St. Install new CBs at pavement edge.
6th Pl S: New SD along NW side of roadway. Install new CBs at pavement edge, and remove ex structures.
Drainage easement required for work done on condominium property. Replace 12" CMP with new 12" SD, and install diversion structure.

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	$18,900	$18,900
2	1	LS	Traffic Control	$3,600	$3,600
3	1	LS	Erosion/Sedimentation Control	$3,600	$3,600
4	1670	LF	Pavement Restoration	$20	$33,400
5	1670	LF	Schedule A Storm Sewer Pipe, 12-Inch Diameter	$60	$100,200
6	15	EA	Catch Basin Type I	$1,930	$28,950
7	4	EA	Catch Basin Type II, 48" Diam.	$4,880	$19,520
8					
9					
10					
			Construction Subtotal (2014 Dollars) =		$208,170
			Inflation from 2014 to 2015	3.65%	$7,598
			Construction Subtotal (2015 Dollars) =		**$215,768**
			Property Acquisition/Easements	25.0%	$53,942
			Contingency	30.0%	$64,730
			Sales Tax	9.3%	$20,066
			Planning Level Construction Cost =		**$354,500**
			Environmental Permitting and Documentation	5.0%	$17,725
			Administration	5.0%	$17,725
			Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	$106,350
			2015 TOTAL =		**$496,300**

ASSUMPTIONS:
Length of pipe, pipe diameter, number of structures and structure size were provided by City of Des Moines.
Mobilization equals approximately 10-percent of Subtotal.
Traffic Control equals approximately 2-percent of Subtotal.
Erosion/Sedimentation Control equals approximately 2-percent of Subtotal ($1,000 min).
Pavement Restoration includes the cost of HMA (2-inch), CSTC (2-inch), and CSBC (4-inch).
Cost of pipe installation includes structure excavation and shoring.
Cost of catch basin installation includes structure excavation and shoring.



Description: Replace existing ditches along east and west sides of 9th Ave S with approximately 860 feet of 12-inch storm pipe and 6 catch basins. The new storm drain system will connect to existing storm system at S 202nd St.
Estimated Cost ($): 185,920
Scoring Criteria: M/I, CMP, PE/PI, DR, REF

Parametrix

N
0 40 80
Feet

- Discharge Point
- Control Structure
- Catchment
- WQ Facility
- Open Channel
- Storm Main

Capital Project and Rank
- High
- Medium
- Low
- Proposed Drain Pipe
- Proposed Catch Basin

- Streams
- 100 Year Flood
- Drainage Basin
- City Limits

Capital Project 38.
9th Avenue (202nd to 206th) Pipe Project

City of Des Moines
Surface Water Comprehensive Plan

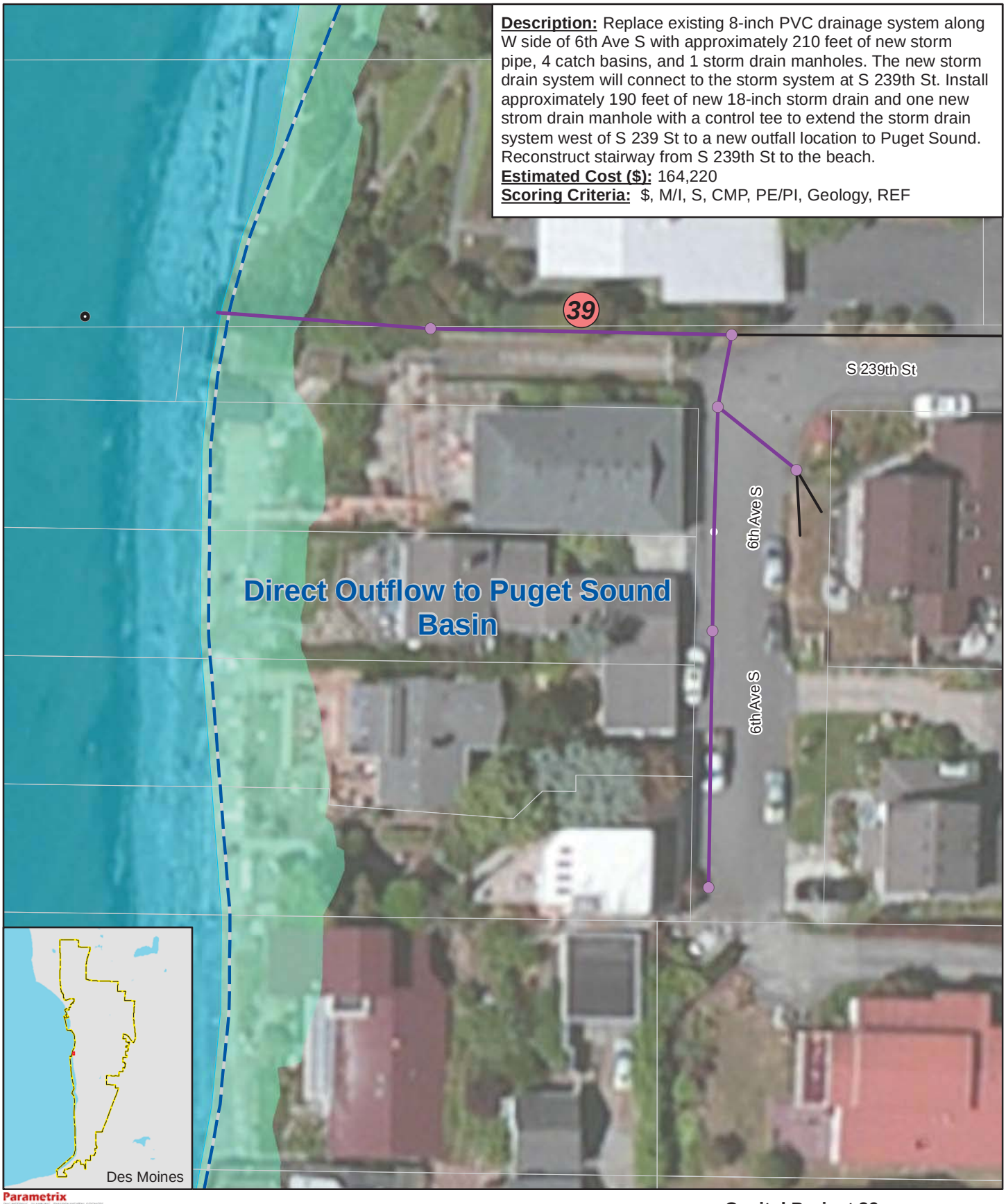
CITY OF DES MOINES
2015 Comprehensive Stormwater Plan Update
Preliminary Opinion of Probable Cost

Capital Project 38
Project Name: 9th Avenue (202nd to 206th) Pipe Project
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:
New SD to connect into ex SD at S 202nd St and run south along E side of 9th Ave S to house number 20410. Cross over to W side of 9th Ave S and continue new SD to its termination at new Type I CB located just north of house number 20437. Install new 2-foot paved shoulder and install CBs at pavement edge.

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	$8,400	$8,400
2	1	LS	Traffic Control	$1,600	$1,600
3	1	LS	Erosion/Sedimentation Control	$1,600	$1,600
4	860	LF	Pavement Restoration	$20	$17,200
5	860	LF	Schedule A Storm Sewer Pipe, 12-Inch Diameter	$60	$51,600
6	6	EA	Catch Basin Type I	$1,930	$11,580
7					
8					
9					
10					

Construction Subtotal (2014 Dollars) =		$91,980
Inflation from 2014 to 2015	3.65%	$3,357
Construction Subtotal (2015 Dollars) =		**$95,337**
Contingency	30.0%	$28,601
Sales Tax	9.3%	$8,866
Planning Level Construction Cost =		**$132,800**
Environmental Permitting and Documentation	5.0%	$6,640
Administration	5.0%	$6,640
Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	$39,840
2015 TOTAL =		**$185,920**

ASSUMPTIONS:
Length of pipe, pipe diameter, number of structures and structure size were provided by City of Des Moines.
Mobilization equals approximately 10-percent of Subtotal.
Traffic Control equals approximately 2-percent of Subtotal.
Erosion/Sedimentation Control equals approximately 2-percent of Subtotal ($1,000 min).
Pavement Restoration includes the cost of HMA (2-inch), CSTC (2-inch), and CSBC (4-inch).
Cost of pipe installation includes structure excavation and shoring.
Cost of catch basin installation includes structure excavation and shoring.



Description: Replace existing 8-inch PVC drainage system along W side of 6th Ave S with approximately 210 feet of new storm pipe, 4 catch basins, and 1 storm drain manholes. The new storm drain system will connect to the storm system at S 239th St. Install approximately 190 feet of new 18-inch storm drain and one new strom drain manhole with a control tee to extend the storm drain system west of S 239 St to a new outfall location to Puget Sound. Reconstruct stairway from S 239th St to the beach.
Estimated Cost ($): 164,220
Scoring Criteria: $, M/I, S, CMP, PE/PI, Geology, REF

Parametrix

N
0 10 20
Feet

- Discharge Point
- Control Structure
- Catchment
- WQ Facility
- Open Channel
- Storm Main

Capital Project and Rank
- High
- Medium
- Low
- Proposed Drain Pipe
- Proposed Catch Basin

- Streams
- 100 Year Flood
- Drainage Basin
- City Limits

Capital Project 39.
6th Avenue/239th St. Pipe Replacement

City of Des Moines
Surface Water Comprehensive Plan

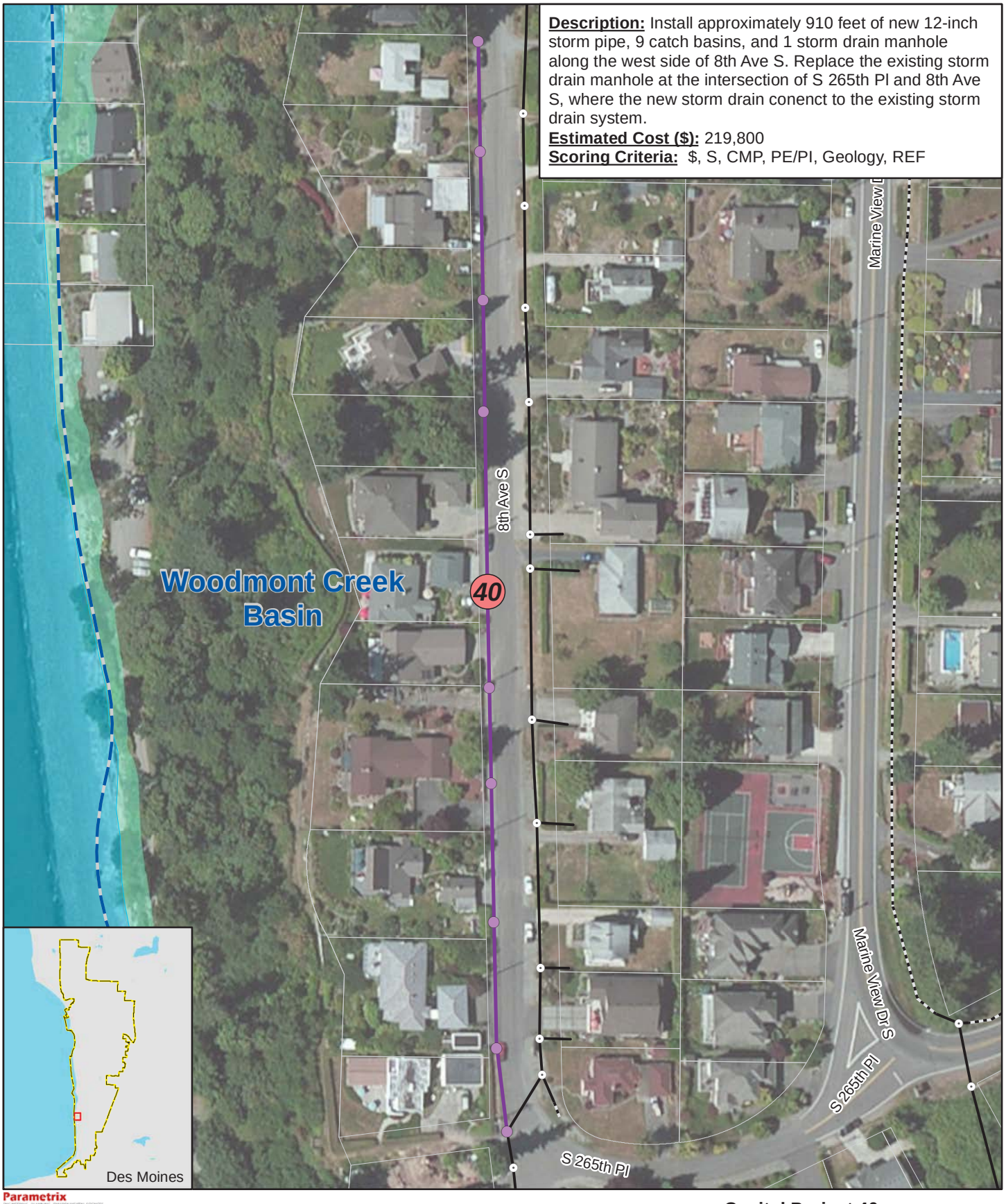
CITY OF DES MOINES
2015 Comprehensive Stormwater Plan Update
Preliminary Opinion of Probable Cost

Capital Project 39
Project Name: 6th Avenue/239th St. Pipe Replacement
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:

Replace existing drainage system along W side of 6th Ave S and connect to drainage system on S 239th St. Remove and replace ex CBs and 8" PVC. Install new 18-inch storm drain outfall from S 239 St to Puget Sound. Reconstruct stairway from S 239th St to the beach.

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	$7,400	$7,400
2	1	LS	Traffic Control	$1,400	$1,400
3	1	LS	Erosion/Sedimentation Control	$1,400	$1,400
4	210	LF	Pavement Restoration	$20	$4,200
5	210	LF	Schedule A Storm Sewer Pipe, 12-Inch Diameter	$60	$12,600
6	190	LF	Schedule A Storm Sewer Pipe, 18-Inch Diameter	$80	$15,200
7	4	EA	Catch Basin Type I	$1,930	$7,720
8	1	EA	Catch Basin Type II, 48" Diam.	$4,880	$4,880
9	1	EA	Catch Basin Type II, 48" Diam. w/ Control Tee	$5,660	$5,660
10	160	LF	Concrete Stair with Metal Handrail	$130	$20,800
			Construction Subtotal (2014 Dollars) =		$81,260
			Inflation from 2014 to 2015	3.65%	$2,966
			Construction Subtotal (2015 Dollars) =		**$84,226**
			Contingency	30.0%	$25,268
			Sales Tax	9.3%	$7,833
			Planning Level Construction Cost =		**$117,300**
			Environmental Permitting and Documentation	5.0%	$5,865
			Administration	5.0%	$5,865
			Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	$35,190
			2015 TOTAL =		**$164,220**

ASSUMPTIONS:
Length of pipe, pipe diameter, number of structures and structure size were provided by City of Des Moines.
Mobilization equals approximately 10-percent of Subtotal.
Traffic Control equals approximately 2-percent of Subtotal.
Erosion/Sedimentation Control equals approximately 2-percent of Subtotal ($1,000 min).
Pavement Restoration includes the cost of HMA (2-inch), CSTC (2-inch), and CSBC (4-inch).
Cost of pipe installation includes structure excavation and shoring.
Cost of catch basin installation includes structure excavation and shoring.



Capital Project 40.
8th Avenue (264th to 265th)
Pipe Project

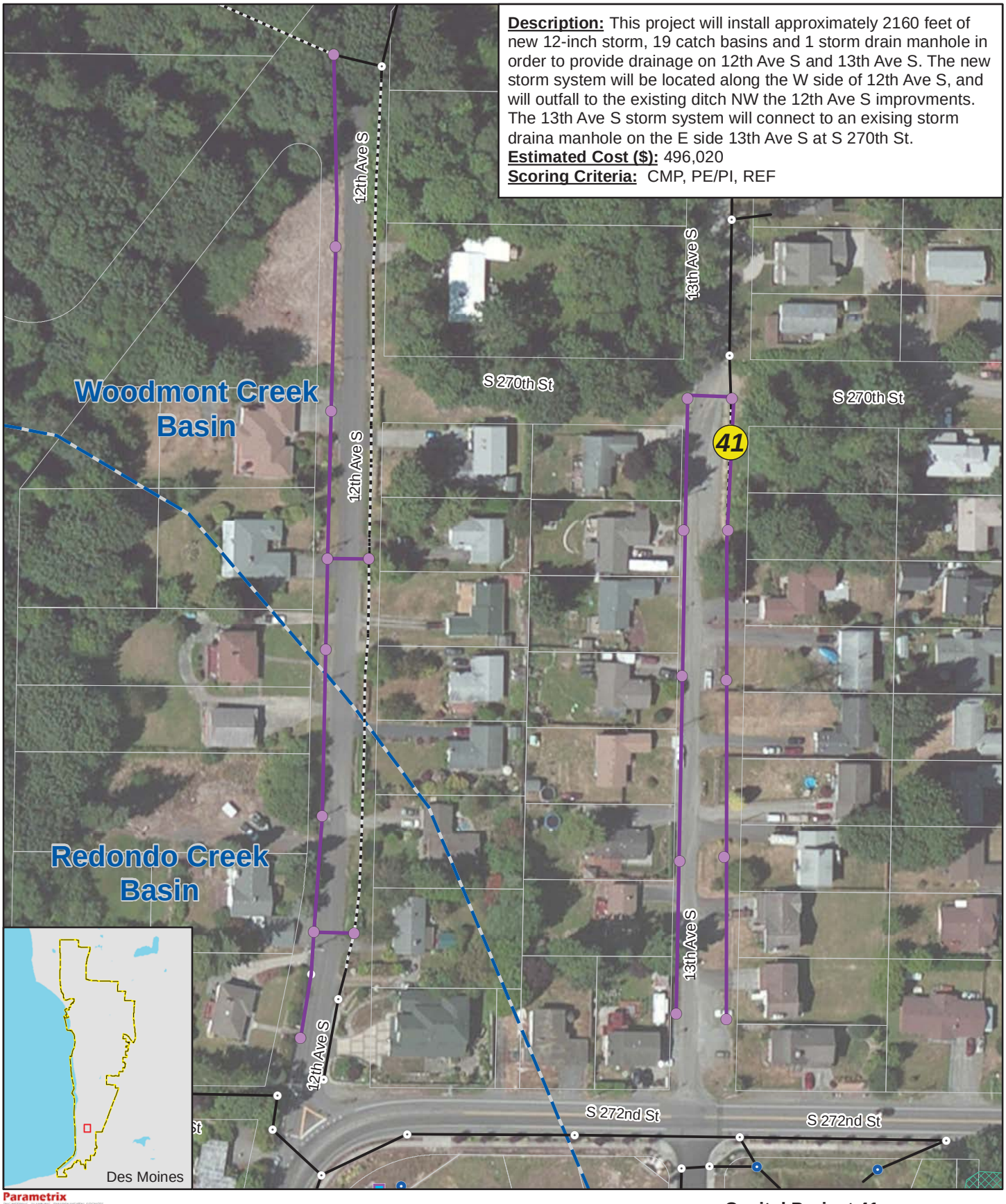
City of Des Moines
Surface Water Comprehensive Plan

CITY OF DES MOINES
2015 Comprehensive Stormwater Plan Update
Preliminary Opinion of Probable Cost

Capital Project 40
Project Name: 8th Avenue (264th to 265th) Pipe Project
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:
New 12" SD along W side of 8th Ave S. Remove and replace ex CB at 8th Ave S and S 265th St.

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	$9,900	$9,900
2	1	LS	Traffic Control	$1,900	$1,900
3	1	LS	Erosion/Sedimentation Control	$1,900	$1,900
4	910	LF	Pavement Restoration	$20	$18,200
5	910	LF	Schedule A Storm Sewer Pipe, 12-Inch Diameter	$60	$54,600
6	9	EA	Catch Basin Type I	$1,930	$17,370
7	1	EA	Catch Basin Type II, 48" Diam.	$4,880	$4,880
8					
9					
10					
			Construction Subtotal (2014 Dollars) =		$108,750
			Inflation from 2014 to 2015	3.65%	$3,969
			Construction Subtotal (2015 Dollars) =		**$112,719**
			Contingency	30.0%	$33,816
			Sales Tax	9.3%	$10,483
			Planning Level Construction Cost =		**$157,000**
			Environmental Permitting and Documentation	5.0%	$7,850
			Administration	5.0%	$7,850
			Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	$47,100
			2015 TOTAL =		**$219,800**

ASSUMPTIONS:
Length of pipe, pipe diameter, number of structures and structure size were provided by City of Des Moines.
Mobilization equals approximately 10-percent of Subtotal.
Traffic Control equals approximately 2-percent of Subtotal.
Erosion/Sedimentation Control equals approximately 2-percent of Subtotal ($1,000 min).
Pavement Restoration includes the cost of HMA (2-inch), CSTC (2-inch), and CSBC (4-inch).
Cost of pipe installation includes structure excavation and shoring.
Cost of catch basin installation includes structure excavation and shoring.



Capital Project 41.
12th/13th Avenue (270th to 272nd Street)

City of Des Moines
Surface Water Comprehensive Plan

CITY OF DES MOINES
2015 Comprehensive Stormwater Plan Update
Preliminary Opinion of Probable Cost

Capital Project 41
Project Name: 12th/13th Ave (270th to 272nd Street)
Prepared By: Mallory Miller **Checked By:** Craig Buitrago
Project Description:

12th Ave S: New 12" SD along W side of 12th Ave S. Install new CB at downstream end of driveway culverts for house address 27010 and 27044, and cross 12th Ave S to connect these to new SD on W end.
13th Ave S: New 12" SD along W and E side of 13th Ave S. Install curb, paved shoulder, and CBs along W side of road. Install CBs along edge of pavement along E side of road. Connect to ex SD on E side of road at S 270th St.

Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount
1	1	LS	Mobilization	$22,300	$22,300
2	1	LS	Traffic Control	$4,300	$4,300
3	1	LS	Erosion/Sedimentation Control	$4,300	$4,300
4	2162	LF	Pavement Restoration	$20	$43,240
5	2162	LF	Schedule A Storm Sewer Pipe, 12-Inch Diameter	$60	$129,720
6	19	EA	Catch Basin Type I	$1,930	$36,670
7	1	EA	Catch Basin Type II, 48" Diam.	$4,880	$4,880
8					
9					
10					

Construction Subtotal (2014 Dollars) =		$245,410
Inflation from 2014 to 2015	3.65%	$8,957
Construction Subtotal (2015 Dollars) =		**$254,367**
Contingency	30.0%	$76,310
Sales Tax	9.3%	$23,656
Planning Level Construction Cost =		**$354,300**
Environmental Permitting and Documentation	5.0%	$17,715
Administration	5.0%	$17,715
Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	$106,290
2015 TOTAL =		**$496,020**

ASSUMPTIONS:
Length of pipe, pipe diameter, number of structures and structure size were provided by City of Des Moines.
Mobilization equals approximately 10-percent of Subtotal.
Traffic Control equals approximately 2-percent of Subtotal.
Erosion/Sedimentation Control equals approximately 2-percent of Subtotal ($1,000 min).
Pavement Restoration includes the cost of HMA (2-inch), CSTC (2-inch), and CSBC (4-inch).
Cost of pipe installation includes structure excavation and shoring.
Cost of catch basin installation includes structure excavation and shoring.

Appendix D

Service Level Matrix

SERVICE LEVEL	PROGRAM ELEMENT										
	Planning & Engineering	Inspections & Maintenance	NPDES							Administration	Capital Improvement Projects
Description	Staff salaries, supplies, and specific labor required for stormwater engineering and planning (stormwater comprehensive plan, annual NPDES reports, etc.).	Routine system inspections and maintenance (includes NPDES-required): field crew staff salaries, equipment, interfund transfers for repairs, etc.	Implementation of NPDES Permit program: monitoring, permit fees, public outreach, and program-specific administration. • SWMP document updates included under Planning & Engineering • Inspections & Maintenance included under Inspections and Maintenance Category							Overhead costs of operating the program: support staff salaries, state taxes, utility taxes, and non-element-specific expenses.	Large-scale construction, expansion, renovation, or replacement projects; purchases of major, long-term use equipment; or major long-term maintenance, repair, or rehabilitation project.
$14.24	$3.07	$5.22	$1.61							$0.91	$3.43
Percent of Total Rate	22%	37%	11%							6%	24%
Current Activities Included in Budget	• Design and manage CIP projects • Permitting plan review. • Respond/resolve drainage public drainage complaints • Inspect construction projects; review, revise and adopt local development related codes, rules and standards to incorporate LID principles and BMPs. • 2014 Surface Water Comprehensive Plan • Miscellaneous consultant engineering services • Drainage basin planning • Des Moines Creek Basin Committee participation • Preparation of engineered work orders for maintenance crews • Pipe Program management • General Grants: writing applications and managing awards 2.5 FTEs: 0.70 SWM Utility Manager 1.00 Engineering Technician 0.50 Engineering Aide 0.30 GIS Analyst	• In addition to NPDES, City requires annual inspections of pipes, swales, ditches, culverts, street gutters, and catch basins (DMMC 11.20.080(5)(a)(ii)) • Paper filing of records and spreadsheet database • Field gear, uniforms, laundry • Heavy equipment rental (stream dredging, catch basin placement, landslide response) • Debris/liquid dump fees from drainage system cleaning. • Equipment repair contingency • Street sweeping (contracted): downtown streets twice monthly, residential streets twice monthly winter/once monthly remainder of year. • Outside contracted drainage repair (large drainage projects beyond time, equipment, or experience limitations of work crew). • Pipe Program labor: City provides heavy equipment and labor to replace residential ditches if owner pays for materials (catch basins, backfill, etc.) 5.90 FTEs: 0.30 PW & Parks Maintenance Superintendent 1.00 Senior Maintenance Workers 4.00 Maintenance Workers 0.60 Asst. City Mechanic (1.00 Senior Maintenance Worker - moved to Parks Operations)	**Public Education** • Website info • Brochure • Quarterly City newsletter • installation of drainage markers • Puget Sound Starts Here campaign • Televised City Council meetings	**Public Involvement** • Website comments • Friends of Des Moines Creek collaboration • WRIA 9 salmon habitat recovery collaboration • Public meetings	**Illicit Discharges** • SW system GIS map developed, being maintained • High-priority issues identified • Staff trained • Field screening • 18 public reports received, all inspected (2012) • 9 illicit connections identified (2012)	**Control Runoff** • New development design review per local codes pollution prevention (budget reflected in Planning & Engineering) • New development stormwater facility inspections • 63 public and 67 private stormwater facilities (2012) • Some facilities identified for reduced inspection frequency (2010)	**Operation & Maintenance** • Annual inspections of all flow control and water quality facilities (swales, detention/infiltration, constructed wetlands, oil/water separators, sediment basins, porous pavement). • Inspect catch basins and inlets every 2 years.	**Monitoring** Annual contributions to Regional Program: • $7,152 monitoring, • $11,916 effectiveness studies • $1,105 source identification	**Tracking & Reporting** • Complaints: web-based; phone hotline. • Data Tracking: spreadsheet log • Budget tracking system in place • Annual NPDES report	• King County Billing Services • King County Collection Services • WRIA 9 fees • Personnel benefits • Office supplies • Janitorial services • Advertising • Travel • Taxes • Professional dues, conferences • Interfund services (computer maintenance, facility insurance, administrative repairs) • Postage, phone, internet • Utilities for Public Works Building 0.3 FTEs: 0.15 PBPW Director 0.15 Administrative Assistant	• The City performs a minimal amount of capital construction, funded by rates and fund balance. • 2014 - 2019 has 9 projects being funded by SWM funds at a 30% allocation of rate revenue
			• NPDES Grants: writing applications and managing awards • Outside professional services, as needed • NPDES training expenses, including travel • NPDES Permit Fee 2.3 FTEs: 0.20 SWM Utility Manager 0.60 Water Quality Specialist/Civil Engineer 0.50 Engineering Aide 1.00 Engineering Technician (Transportation Tech temporarily assigned to SWM)								

SERVICE LEVEL	PROGRAM ELEMENT											
	Planning & Engineering	Inspections & Maintenance	NPDES							Administration	Capital Improvement Projects
			Public Education	Public Involvement	Illicit Discharges	Control Runoff	Operation & Maintenance	Monitoring	Tracking & Reporting		
Gaps in Existing Program	• None identified	• Crews inspecting approximately 60% of all catch basins annually. Add 0.33 FTE to maintenance staff (as a back-up to maintain 2 full 2-person crews at all times)	• None identified	• None identified	• None identified	• None identified	• 93% of private facilities and 95% of public facilities inspected during last 5-year permit cycle. Add 0.33 FTE to increase inspection coverage	• None identified	• Inspection and maintenance database not current with most recent activities. Add 0.33 FTE to input backlog of inspections and maintenance records	• None identified	• City requires all storm water facilities to be maintained so that they operate as intended (DMMC 11.20.080 (2)(a)). • No current systematic repair and/or replacement of aging capital assets (conveyance system, flow control facilities, and water quality treatment facilities). Add emergency repair and replacement service fund of $380k, paid for through CIP transfer in 2015, then increased only to adjust for inflation in subsequent years.
Recom-mendations	• Programmatic SEPA for Surface Water CIPs • Prepare Project Management Manual or Project Management training for staff to effectively manage additional Surface Water CIPs • Add (or reallocate) 1.0 FTE to support additional CIP implementation (project management, construction management, procurement, etc.) • Establish a drainage permit fee to help fund new development design reviews and inspections.	• CCTV condition assessment of 15% of SD system annually until complete (City plans to purchase equipment for $15k) • Reduce required inspection frequency for pipes, swales, ditches, culverts, street gutters, and catch basins to once per two years • Discontinue Pipe Program and reallocate staff and funds to Pipe Replacement capital project.	• None identified	• None identified	• None identified	• None identified	• None identified	• None identified	• Update tracking database to electronic software. • Organize and assess existing basin/water quality info (monitoring data, mapping, reports) to identify and prioritize potential water quality retrofit projects.	• Increase budget proportionately to support upgrades of other program elements • Track SWM revenue grown and use proceeds to cover additional staff and equipment	

Appendix E

Surface Water Management Program Financial Analysis

FCS GROUP
Solutions-Oriented Consulting

Memorandum

To: Loren Reinhold; City of Des Moines
Julie Brandt, Austin Fisher; Parametrix

Date: February 27, 2015

From: John Ghilarducci, Ryan Bert; FCS GROUP

RE: Surface Water Rate & General Facilities Charge Update

1.0 Introduction & Background

In support of the 2014 Surface Water Plan (SWP) update, Parametrix, Inc. (Parametrix) contracted with Financial Consulting Solutions Group, Inc. (FCS GROUP) to perform a surface water rate update for the City of Des Moines. Specific tasks included:

- Developing an estimated revenue requirement and cash flow projection for the next 10 years (2015-2024), incorporating:
  - The list of prioritized capital improvement projects, as developed by Parametrix.
  - Recommended surface water utility program changes, as developed by Parametrix, in order to respond to any existing gaps in surface water operations.
  - Various service level scenarios for both capital funding aspects and additions to the operating program.
  - Current financial information including a review of the utility's capital funding status, financial policies, and procedures.
- Summarizing revenue requirement and rate results in a level of service matrix to communicate varying service levels and associated costs.
- Updating surface water general facilities charges (GFC), developing alternatives for each capital service level.

This memorandum discusses the various aspects of the process used to develop surface water rates and GFCs for the City.

2.0 Fiscal Policies

Fiscal policies provide the basic framework for evaluating utility revenue needs. These policies, which can address a variety of topics including cash management, capital funding, and financial performance, intend to promote long-term financial viability for the City's utility.

2.1 Utility Reserves

Reserves are a key component of any utility financial strategy, as they provide the flexibility to manage variations in costs and revenues that could otherwise have an adverse impact on ratepayers. For the purpose of this analysis, the City's surface water utility resources are separated into three funds:

- ***Operating Fund:*** Operating reserves are designed to provide a liquidity cushion to ensure that adequate cash working capital will be maintained to address significant cash balance fluctuations, such as seasonal fluctuations in billings and receipts, unanticipated cash operating expenses, or lower than expected revenue collections. Target funding levels are generally expressed in number of days' cash operating expenses, with the minimum requirement varying with the expected risk of unanticipated needs. Surface water customers are billed *annually* on the King County property tax statement, for which the County charges the City a small billing fee per account. A majority of these bills are paid in April and October installments. Because the impervious service area basis of charging changes very little from year to year, the surface water utility generates relatively constant and predictable rate revenue. Due to the fee's inclusion on the property tax statement, however, the City must plan for a twice yearly revenue generation pattern, and begin each year with a substantial fund balance to ensure positive cash flow. The City's current fiscal policy requires the Operating Fund to maintain a minimum fund balance equal to (4) months of operating expenses, plus an additional 7% contingency intended to be used for emergency purposes only. The target minimum balance for 2014 equates to roughly $862,000.

- ***Capital Fund:*** The Capital Fund represents the hub of the surface water utility's capital activity. Inflows include debt proceeds (if applicable), GFC revenues, capital grants and other contributions, and the rate-funded capital transfer from the Operating Fund. The City spends these funds on capital projects. This analysis assumes a target minimum balance equal to 1% of plant-in-service, which equates to roughly $212,000 based on the constructed plant assets listed in the 2013 audited financial statements.

- ***Capital Reserve Fund:*** In 2015, the City is planning to establish a Capital Reserve Fund for added emergency protection. The Capital Reserve Fund will be made available in case of an emergency, should a piece of equipment or a portion of the utility's infrastructure fail unexpectedly. Additionally, reserve balances could be used for other unanticipated capital needs, including project cost overruns. These reserves are not intended to cover the costs of system-wide failures resulting from catastrophic events. The Capital Reserve Fund is assumed to receive initial funding through expected general facilities charges in 2015, primarily through the estimated GFCs from Des Moines Creek Business Park ($343,778), kicking off the fund with a total beginning balance of $350,000. Should the Capital Fund require the use of Capital Reserve Fund dollars, a transfer of funds will be made; it is assumed that the transferred amount will be replenished within a three year time period through increased rate-funded capital transfers.

2.2 Capital Funding

The City can use a variety of funding sources to pay for capital costs:

- ***Grants/Developer Contributions:*** These funds are outside sources of funding that derive from third-party sources and contribute toward certain capital projects – the City would most rationally use this money to fund project costs before tapping its own resources.

- ***Capital Fund Cash:*** This is the pool of money that the City has set aside for capital purposes, and would include GFC revenues (to the extent that it is not used for debt repayment), interest earned on money in the Capital Fund, and money transferred to the Capital Fund from other funds.

- ***Loans:*** To the extent that low-cost loans are available, they would be used to supplement cash funding for projects. These funds generally require the availability of a loan program, and may come with other requirements. Based on input from City staff, the analysis does not assume any low-cost loans.

- ***Revenue Bonds:*** Revenue bonds would be used to cover capital needs in excess of other available resources. They are considered less desirable than other forms of debt due to their relatively high interest rates and additional coverage requirements; they require the City to pledge its surface water utility revenues for their repayment. Based on input from City staff, the analysis does not assume any revenue bond issues.

2.3 Financial Performance

The utility's financial performance policies define the minimum standards for annual financial performance. The City's budget process establishes a common utility standard for a balanced budget. Beyond that minimum, the utility budgeting process should also meet the minimum reserve requirements outlined above. In general, this standard results in an annual requirement for positive cash flow from operations. A possible short-term exception would be when the Operating Fund balance exceeds the relevant minimum balance requirements and the City makes an explicit decision to transfer the surplus for capital project funding, or to phase in rate increases over time.

The second criterion relates to utility debt service coverage. The City's surface water utility currently has no outstanding revenue bond debt. When applicable, however, a debt service coverage calculation takes into consideration the coverage requirements, allowable revenues, and expenses that are considered to be "operational". All subordinate debt is excluded from the calculation on the premise that such debt would hold a junior position and would only be repaid after revenue bond payments are satisfied. Because the coverage test does not consider rate-funded capital funding (depreciation), other rate-funded capital outlays, or reserve funding needs, it is conceptually possible that a utility could meet its coverage requirements yet end up with negative cash flow after all debt service is paid.

A common requirement for utility bond coverage is a coverage ratio of 1.25, meaning that the utility must generate enough revenue to cover operating expenses plus 125% of annual revenue bond debt service. Besides being a legal requirement, the coverage ratio actually realized is an important statistic used to rate a utility's financial integrity and ability to meet its existing and future debt obligations. Revenue generated to comply with coverage requirements may be used for capital purposes, and may reduce the amount of revenue needed to meet cash needs in subsequent years – it

can also be used to meet capital requirements (and may thus reduce future borrowing), but generally cannot be held over to reduce coverage needs in subsequent years.

2.4 Service Level Scenarios

As part of this study, four service levels and their resulting rate impacts were defined and analyzed. Summaries of the capital funding and operating program assumptions are outlined below for each service level:

- ***Capital Funding:*** Incorporating the prioritized CIP from Parametrix, service levels vary according to the number of future capital projects funded by the utility (in order of priority). In order to fund a more comprehensive capital program without issuing debt, rate increases and adjustments to the rate-funded capital transfer are utilized to generate results.
  - Service Level 1: Holding rate increases at an inflationary level of 2.3% (weighted average of City inflation assumptions), Scenario 1 funds as many high priority capital projects as possible by the end of the planning period (2015-2024).
  - Service Level 2: Fund the same capital projects as completed under Service Level 1 (timing may differ). Surface water rates must increase due to differences in the operating program (see section below).
  - Service Level 3: All high priority capital projects are funded by the end of 2024; surface water rates must increase as a result.
  - Service Level 4: All high priority and medium priority capital projects are funded by the end of 2024; surface water rates must increase as a result.

- ***Operating Program Additions:*** In addition to the capital funding assumptions listed above, the following operating program additions are assumed under each service level. Outlined below are the operating additions occurring under all levels, as well as any assumptions unique to individual levels. Unless otherwise noted, operating additions are assumed to take effect in 2015. All cost estimates were provided by Parametrix.
  - The following changes are assumed in all service levels, as changes to the operating program maintain existing regulatory requirements and increase cost efficiency.
    - Establish a drainage permit fee: revenues of $25,000 per year.
    - Charge the Street Fund for waste disposal: revenues of $10,000 per year.
    - Increased use of utility staff for CIP management: savings of $30,000 per year.
    - CCTV 15% of the surface water system: one-time expense of $15,000 in 2015.
    - Addition of 1.0 FTE to perform surface water tasks necessary to adhere to regulatory requirements. 1.0 FTE (maintenance pay grade) includes 0.33 FTE allocated for NPDES inspections, 0.33 FTE allocated for non-NPDES inspections, and 0.33 FTE allocated for the input of backlog information. Incorporating the City's average maintenance employee salary and benefit costs, 1.0 FTE at a maintenance pay grade is expected to cost $91,290 per year.

  In addition to the operating additions listed above, the following differences are assumed to occur under each additional service level:
  - Service Level 1: The operating program eliminates the pipe program ($110,000 per year) to pay for the additional 1.0 FTE needed for maintenance.

- Service Level 2: No additional changes to the operating program. This service level and subsequent service levels include the pipe program..
- Service Level 3: The operating program adds an additional full-time employee (engineering pay grade at $113,923 per year) as customer growth permits to help manage CIP implementation. With the assumed customer growth rate of 0.50% per year and the expected Des Moines Business Park rate revenue in 2016 ($35,000 per year), the surface water utility is expected to reach enough growth related revenue (applying 2014 rates to expected new customers) to pay for the FTE in 2021.
- Scenario 4: The operating program adds an additional FTE (engineering pay grade) immediately in 2015 to help manage the CIP.

3.0 Surface Water Revenue Requirement Forecast

The revenue requirement is the amount of revenue that rates must generate to enable the City to meet the various financial obligations of its surface water utility. This analysis has two main purposes – it serves as a means of evaluating the utility's fiscal health and adequacy of current rate levels, and it sets the basis for near and long-term rate planning. The rate revenue requirement is defined as the net difference between total revenue needs and the revenue generated through non-rate sources. Hence, the revenue requirement analysis involves defining and forecasting both needs and resources.

3.1 Key Assumptions

Before a revenue requirement analysis can be done, a series of assumptions are formulated to create a basis for the analysis. The assumptions affecting the analysis are discussed below.

- ***Customer Growth:*** To represent current trends in customer growth, the City budget estimates customer growth to be about 0.50% per year. In the near-term, these growth projections add 70 – 75 EBUs to the system each year.
- ***Debt Financing:*** This analysis assumes that the City will not need to issue debt to pay for capital projects, as the rate-funded capital transfer is adjusted each year to cover capital expenditures. It should be noted that if additional financial flexibility is needed, the City could pursue revenue bond issuances in the future.
- ***Cost Inflation:*** This analysis assumes that all costs will increase with inflation in the future.
  - Capital costs are assumed to increase by the Engineering News Record (ENR) City of Seattle Construction Cost Index (CCI) of 3.0% per year, and operating costs are assumed to increase by the Seattle Consumer Price Index (CPI) of 2.0% per year, consistent with the inflationary assumptions built into the City's budgets.

3.2 Capital Funding Strategy

To remain debt-free, the City is planning to fund its projected capital costs through a combination of internal cash resources (rate revenue, non-rate revenue, GFCs) and grant funding. The financial forecast assumes the following conceptual capital funding hierarchy:

- Any available grant funds or developer contributions would be considered first, as they are generally restricted in use but could free up City funding resources for other purposes. This analysis assumes the following funding in the future:

  - King County Flood Reduction Grant: $200,000 in 2015 for Lower Massey Creek modifications.
  - King County Flood Control Grant: $180,000 in 2015 for Lower Massey Creek modifications.
  - Normandy Park Interlocal Agreement: $29,800 in 2018 and $204,750 in 2019 for the 1st Avenue Pond Expansion project.
  - King County Flood District: All cities within the District boundary receive a share of this non-competitive grant each year to go towards any project that reduces flooding. These funds may be used each year or accumulated over time to use for a larger project. The City's share of the King County Flood District grant is $36,500 per year.
- Anticipated low-cost loans would then be used, if any are available. Based on input from City staff, the analysis assumes no future debt or low-cost loan financing.
- Cash resources are next, including projected GFC revenues, rate-funded capital transfers, and available cash reserves (to the extent that they exceed the policy minimum balances). In the event that the Operating Fund has a balance above the minimum target, this analysis assumes that funds may be transferred to the capital fund as needed to avoid future debt issuance.
- Revenue bonds are a relatively high-cost source of funding with additional coverage requirements, and as such are the last resort to cover costs in excess of other available resources.

Exhibit 1 shows the CIP for each service level as described previously, and the funding strategies developed as part of this study.

Exhibit 1: Summary of Capital Cost Projections and Funding Strategy

	LOS 1		LOS 2		LOS 3		LOS 4	
CIP PROJECTS	**Year [a]**	**Escalated Cost**	**Year [a]**	**Escalated Cost**	**Year [a]**	**Escalated Cost**	**Year [a]**	**Escalated Cost**
HIGH PRIORITY (ordered by ranking)								
CIP-16: 5th Avenue South/212th Street Pipe Upgrade	2020	$ 839,569	2020	$ 839,569	2019	$ 815,116	2019	$ 815,116
CIP-3: Lower Massey Creek Channel Modifications	2015	$ 1,248,565	2015	$ 1,248,565	2015	$ 1,248,565	2015	$ 1,248,565
CIP-30: North Fork McSorley Creek Diversion Project	2021	$ 445,334	2021	$ 445,334	2020	$ 432,363	2019	$ 419,770
CIP-4 : Barnes Creek/Kent Des Moines Road Culvert Replacement	2015-2017	$ 1,544,436	2015-2017	$ 1,544,436	2015-2017	$ 1,544,436	2015-2017	$ 1,544,436
CIP-39: 6th Avenue/239th St. Pipe Replacement	2021	$ 196,087	2021	$ 196,087	2020	$ 190,376	2020	$ 190,376
CIP-36: 14th Avenue (268th to 272nd) Pipe Upgrade	2022	$ 506,388	2022	$ 506,388	2020	$ 477,320	2020	$ 477,320
CIP-17: 216th Place/Marine View Drive Pipe Upgrade	2022	$ 317,676	2022	$ 317,676	2021	$ 308,424	2020	$ 299,440
CIP-25A: KDM/16th Avenue Pipe Replacement Project	2022	$ 279,280	2022	$ 279,280	2021	$ 271,145	2020	$ 263,248
CIP-18: Des Moines Memorial Drive - S. 208th to S. 212th Pipe Project	2023	$ 639,694	2023	$ 639,694	2021	$ 602,973	2021	$ 602,973
CIP-40: 8th Avenue (264th to 265th) Pipe Project	2023	$ 278,436	2023	$ 278,436	2022	$ 270,326	2021	$ 262,453
CIP-5: 24th Avenue Pipeline Replacement	2015	$ 260,100	2015	$ 260,100	2015	$ 260,100	2015	$ 260,100
CIP-25B: KDM/16th Avenue (228th to KDM Rd) Pipe Project	2024	$ 932,156	2024	$ 932,156	2022	$ 878,646	2021	$ 853,055
CIP-26: 232nd Street (10th to 14th) Pipe Project					2023	$ 629,053	2022	$ 610,731
CIP-23: 24th Avenue (223rd to 224th) Pipe Upgrade					2023	$ 286,417	2022	$ 278,074
CIP-34: 258th Street (13th Pl to 16th Ave) Pipe Project					2024	$ 445,711	2022	$ 420,125
CIP-37: 6th Place/287th Street Pipe Replacement Project					2024	$ 647,559	2022	$ 610,386
CIP-14: 1st Place South (209th to 210th) Pipe Project					2024	$ 275,646	2022	$ 259,823
CIP-7: 1st Avenue Pond Expansion	2018-2019	$ 374,922	2018-2019	$ 374,922	2018-2019	$ 374,922	2018-2019	$ 374,922
CIP-9: Pipe Replacement Program (unidentified projects)	2016-2020	$ 1,609,403	2017-2021	$ 1,657,685	2017-2021	$ 1,657,685	2017-2021	$ 1,657,685
MEDIUM PRIORITY (ordered by ranking)								
CIP-38: 9th Avenue (202nd to 206th) Pipe Project							2023	$ 235,518
CIP-15: 3rd Avenue South (213th to 216th) Pipe Project							2023	$ 408,077
CIP-31: 20th Avenue/243rd Street Pipe Upgrade							2023	$ 471,036
CIP-35: 22nd Avenue Outfall Project							2023	$ 242,434
CIP-6: 199th North Hill Trunkline Upgrade							2018-2019	$ 259,345
CIP-8: North Hill NE and 197th Street Trunkline Upgrade							2017-2018	$ 525,291
CIP-32: 242nd Street (26th Ave to 26th Pl) Pipe Project							2023	$ 126,804
CIP-11: Saltwater Highlands Tract A pond replacement							2023	$ 457,256
CIP-27: 240th Street (MVD to 11th Place) Pipe Project							2024	$ 448,633
CIP-22: 220th Street (15th Ave to SJU Park) Pipe Replacement Project							2024	$ 438,221
CIP-33: 252nd Street/9th Avenue Pipe Project							2024	$ 249,525
CIP-41: 12th/13th Avenue (270th to 272nd Street)							2024	$ 647,194
Emergency Contingency: $150K (unescalated) every (3) years		$ 507,807		$ 507,807	-	$ 507,807	-	$ 507,807
Total		**$ 9,979,854**		**$ 10,028,136**		**$ 12,124,590**		**$ 16,465,739**

[a] Study Period: 2015-2024

CAPITAL FUNDING	LOS 1	LOS 2	LOS 3	LOS 4
Grants / Developer Contributed	$ 943,050	$ 943,050	$ 943,050	$ 943,050
GFCs	$ 1,507,157	$ 1,506,410	$ 1,577,669	$ 1,721,535
Rate-Funded Capital	$ 7,529,647	$ 7,578,677	$ 9,603,870	$ 13,801,154
Total	**$ 9,979,854**	**$ 10,028,136**	**$ 12,124,590**	**$ 16,465,739**

3.3 Operating Forecast

Operating expense projections for 2015 are generally based on the City's 2014 Budget and service level information provided by Parametrix. The forecast of operating expenses beyond 2014 is also based on this information, generally reflecting annual inflationary increases. Operating revenues are also forecasted to offset projected operating expenses – these revenues are generally assumed to grow with customer growth. As an exception to this, the analysis computes interest earnings on projected reserve balances assuming an annual interest earnings rate of 0.26% for the study period, based on the City's 2014 projected investment interest earnings.

Surface water rate revenue levels for 2015 are initially based on 2014 budgeted revenues and adjusted for growth. As discussed with City staff, the 2015 budgeted rate revenues include the expected inflationary rate increase of 3.65%, implemented in January 2015.

3.4 Policy-Based & Other Revenue Needs

Other costs that the City's surface water rates must fund include:

- ***Rate-Funded Capital Transfer:*** Effective 2009, the City established an internal budgetary goal to transfer 30% of rate revenues to the Capital Fund to be used for capital purposes. For purposes of this analysis, it is assumed that the City may adjust this transfer on an annual basis in order to balance the objectives of adequately funding the City's capital needs with each service level and maintain affordable rates. Each service level therefore has a unique schedule of rate-funded capital transfers over the study period.

- ***Reserve Funding:*** As previously noted, this analysis assumes that the City remains consistent with its historical practices and maintains an operating reserve with a minimum target balance equal to 4 months of projected operating expenses, plus an additional 7% contingency. It is worth noting that as operating expenses are projected to increase over time, the target balance for the operating reserve increases – if the operating reserve balance is projected to fall short of its moving target, rates must generate a corresponding surplus to cover the difference. This analysis also assumes a minimum target balance for the Capital Fund equal to 1% of fixed plant assets, or roughly $212,000 in 2014. The City will begin funding a Capital Reserve Fund in 2015 with a beginning balance of $350,000. Per input from City staff, the City expects to make a $150,000 transfer to the Capital Fund every three years, assuming the Capital Reserve Fund will be reimbursed $50,000 each year over the following three years through an increased rate-funded capital transfer.

3.5 Revenue Sufficiency

With revenues and expenses defined and projected, the next step is to define the amount of revenue needed to meet the surface water utility's financial needs and policy objectives. The financial forecast defines the level of revenue needed via a series of tests:

3.5.1 Cash Flow Sufficiency Test

Conceptually, the cash flow test determines the amount of revenue the surface water utility needs to generate in order to meet its cash obligations. The cash flow obligations relating to rates include:

- Operating, maintenance and administrative expenses
- Debt service payments (if applicable)
- Rate-funded capital transfers
- Additions to operating reserves

Offsetting these obligations are various sources of revenue, including:

- Surface water rate revenues
- Operating Fund interest earnings
- Miscellaneous operating and non-operating revenues
- Interest earned on bond reserves (if applicable)
- Use of bond reserves to make final-year payments (if applicable)

To satisfy this test, surface water rate revenue must be sufficient to meet the projected cash flow needs net of other revenue sources. Capital resources such as grant funding, bond proceeds, or GFC revenues are not typically considered available for meeting these cash flow needs, but become part of the resources used for capital project funding. This policy is conservative in that it avoids reliance on growth-dependent charges to meet the utility's financial objectives.

3.5.2 Coverage Sufficiency Test

The City's surface water utility does not currently, and is not expected to acquire any debt financing proceeds within the study period. Should the City decide to pursue debt financing in the future, revenue bond covenants include a bond coverage requirement in which the borrower must agree to collect enough revenue so that "net revenue" (defined as rate revenue plus interest earnings and miscellaneous operating revenue, less cash operating expenses) covers a multiple of annual debt service costs. Typically, bond issuers will set the legal minimum coverage ratio at 1.25.

Note that the calculation would exclude rate-funded capital, reserve funding, and loan debt service; as it is a test of annual financial performance, it also precludes the use of reserves to cover shortfalls in net revenue.

3.5.3 Evaluation of Revenue Sufficiency

The cash flow and coverage sufficiency tests each provide a different perspective on how much revenue is appropriate and helps ensure that appropriate rate adjustments, if any, fulfill the utility's near-term needs and long-term goals. This multi-faceted approach reduces the utility's financial risk and increases financial stability – any near-term increases which result will help to ensure lower and more stable long-term rates.

Exhibits 2-5 show the revenue requirement forecast for all four service levels. Both a detailed short-term (2014-2020), and summarized long-term projection (2015-2024) are provided. **Exhibit 6** provides summarized 2016 results in a single service level matrix.

Exhibit 2: Surface Water Revenue Requirement Forecast: Service Level 1

Revenue Requirement	2014	2015	2016	2017	2018	2019	2020
Revenues							
Rate Revenues Under Existing Rates	$ 2,410,663	$ 2,422,716	$ 2,470,005	$ 2,482,355	$ 2,494,767	$ 2,507,241	$ 2,519,777
Non-Rate Revenues	289,270	335,454	319,629	320,425	321,031	322,724	323,987
Total Revenues	**$ 2,699,933**	**$ 2,758,170**	**$ 2,789,634**	**$ 2,802,780**	**$ 2,815,798**	**$ 2,829,965**	**$ 2,843,763**
Expenses							
Cash Operating Expenses	$ 2,451,376	$ 2,297,041	$ 2,298,491	$ 2,337,308	$ 2,376,889	$ 2,417,249	$ 2,458,404
Existing Debt Service	1,020	1,020	1,020	1,020	1,020	-	-
New Debt Service	-	-	-	-	-	-	-
Rate Funded Transfer to Capital Fund	486,455	482,133	753,344	811,904	430,829	636,728	683,092
Rate Funded Transfer to Capital Reserve Fund	-	-	-	50,000	50,000	50,000	50,000
Additions to Meet Required Operating Reserve	-	-	-	-	190,464	-	-
Total Expenses	**$ 2,938,851**	**$ 2,780,194**	**$ 3,052,854**	**$ 3,200,231**	**$ 3,049,201**	**$ 3,103,977**	**$ 3,191,495**
Net Surplus (Deficiency) Before Rate Increase	**$ (238,918)**	**$ (22,023)**	**$ (263,220)**	**$ (397,451)**	**$ (233,403)**	**$ (274,012)**	**$ (347,732)**
Additions to Meet Coverage	-	-	-	-	-	-	-
Total Surplus (Deficiency) Before Rate Increase	**$ (238,918)**	**$ (22,023)**	**$ (263,220)**	**$ (397,451)**	**$ (233,403)**	**$ (274,012)**	**$ (347,732)**
ANNUAL RATE INCREASE	**0.00%**	**3.65%**	**2.30%**	**2.30%**	**2.30%**	**2.30%**	**2.30%**
CUMULATIVE RATE INCREASE	**0.00%**	**3.65%**	**6.03%**	**8.47%**	**10.97%**	**13.52%**	**16.13%**
Rate Revenues After Rate Increase	$ 2,410,663	$ 2,511,145	$ 2,619,044	$ 2,692,678	$ 2,768,383	$ 2,846,216	$ 2,926,237
Additional Taxes from Rate Increase	$ -	$ 6,632	$ 11,178	$ 15,774	$ 20,521	$ 25,423	$ 30,485
Net Cash Flow After Rate Increase	**$ (238,918)**	**$ 59,774**	**$ (125,359)**	**$ (202,902)**	**$ 19,692**	**$ 39,540**	**$ 28,244**
Bond Coverage After Rate Increases	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**
Sample Monthly Bill per EBU [a]	**$ 14.24**	**$ 14.76**	**$ 15.10**	**$ 15.45**	**$ 15.80**	**$ 16.17**	**$ 16.54**
Average Monthly Increase ($)	$ -	$ 0.52	$ 0.34	$ 0.35	$ 0.36	$ 0.36	$ 0.37

[a] 1 EBU = 3,450 impervious sq. ft. Before taxes.

Projected Ending Fund Balance	2014	2015	2016	2017	2018	2019	2020
Operating Fund	$ 914,168	$ 973,942	$ 848,583	$ 645,680	$ 855,836	$ 895,376	$ 923,620
Capital Fund	$ 1,190,537	$ 525,575	$ 773,044	$ 273,990	$ 503,661	$ 843,964	$ 528,547
Capital Reserve Fund	$ -	$ 350,000	$ 200,000	$ 250,000	$ 300,000	$ 200,000	$ 250,000
COMBINED ENDING BALANCE	**$ 2,104,705**	**$ 1,849,517**	**$ 1,821,626**	**$ 1,169,670**	**$ 1,659,497**	**$ 1,939,340**	**$ 1,702,167**

Summary	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Rate Revenue	$ 2,511,145	$ 2,619,044	$ 2,692,678	$ 2,768,383	$ 2,846,216	$ 2,926,237	$ 3,008,508	$ 3,093,093	$ 3,180,055	$ 3,269,462
Rate Funded Capital	$ 482,133	$ 753,344	$ 861,904	$ 480,829	$ 686,728	$ 733,092	$ 781,559	$ 862,297	$ 854,204	$ 876,814
Rate Increases	**3.65%**	**2.30%**	**2.30%**	**2.30%**	**2.30%**	**2.30%**	**2.30%**	**2.30%**	**2.30%**	**2.30%**
Monthly Rate / EBU	**$ 14.76**	**$ 15.10**	**$ 15.45**	**$ 15.80**	**$ 16.17**	**$ 16.54**	**$ 16.92**	**$ 17.31**	**$ 17.70**	**$ 18.11**

Exhibit 3: Surface Water Revenue Requirement Forecast: Service Level 2

Revenue Requirement	2014	2015	2016	2017	2018	2019	2020
Revenues							
Rate Revenues Under Existing Rates	$ 2,410,663	$ 2,422,716	$ 2,470,005	$ 2,482,355	$ 2,494,767	$ 2,507,241	$ 2,519,777
Non-Rate Revenues	289,270	335,454	319,339	320,469	321,354	322,833	323,996
Total Revenues	**$ 2,699,933**	**$ 2,758,170**	**$ 2,789,344**	**$ 2,802,824**	**$ 2,816,121**	**$ 2,830,073**	**$ 2,843,773**
Expenses							
Cash Operating Expenses	$ 2,451,376	$ 2,407,041	$ 2,410,685	$ 2,451,746	$ 2,493,616	$ 2,536,310	$ 2,579,846
Existing Debt Service	1,020	1,020	1,020	1,020	1,020	-	-
New Debt Service	-	-	-	-	-	-	-
Rate Funded Transfer to Capital Fund	486,455	482,133	552,452	673,629	500,925	662,569	681,197
Rate Funded Transfer to Capital Reserve Fund	-	-	-	50,000	50,000	50,000	50,000
Additions to Meet Required Operating Reserve	-	-	-	-	105,512	-	6,673
Total Expenses	**$ 2,938,851**	**$ 2,890,194**	**$ 2,964,157**	**$ 3,176,395**	**$ 3,151,073**	**$ 3,248,879**	**$ 3,317,716**
Net Surplus (Deficiency) Before Rate Increase	**$ (238,918)**	**$ (132,023)**	**$ (174,813)**	**$ (373,571)**	**$ (334,952)**	**$ (418,806)**	**$ (473,944)**
Additions to Meet Coverage	-	-	-	-	-	-	-
Total Surplus (Deficiency) Before Rate Increase	**$ (238,918)**	**$ (132,023)**	**$ (174,813)**	**$ (373,571)**	**$ (334,952)**	**$ (418,806)**	**$ (473,944)**
ANNUAL RATE INCREASE	**0.00%**	**3.65%**	**4.00%**	**4.00%**	**3.00%**	**2.30%**	**2.30%**
CUMULATIVE RATE INCREASE	**0.00%**	**3.65%**	**7.80%**	**12.11%**	**15.47%**	**18.13%**	**20.84%**
Rate Revenues After Rate Increase	$ 2,410,663	$ 2,511,145	$ 2,662,566	$ 2,782,914	$ 2,880,734	$ 2,961,726	$ 3,044,995
Additional Taxes from Rate Increase	$ -	$ 6,632	$ 14,442	$ 22,542	$ 28,948	$ 34,086	$ 39,391
Net Cash Flow After Rate Increase	**$ (238,918)**	**$ (50,226)**	**$ 3,306**	**$ (95,554)**	**$ 22,068**	**$ 1,593**	**$ 11,883**
Bond Coverage After Rate Increases	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**
Sample Monthly Bill per EBU [a]	**$ 14.24**	**$ 14.76**	**$ 15.35**	**$ 15.96**	**$ 16.44**	**$ 16.82**	**$ 17.21**
Average Monthly Increase ($)	$ -	$ 0.52	$ 0.59	$ 0.61	$ 0.48	$ 0.38	$ 0.39

[a] 1 EBU = 3,450 impervious sq. ft. Before taxes.

Projected Ending Fund Balance	2014	2015	2016	2017	2018	2019	2020
Operating Fund	$ 914,168	$ 863,942	$ 867,248	$ 771,694	$ 899,274	$ 900,867	$ 919,423
Capital Fund	$ 1,190,537	$ 525,575	$ 898,023	$ 249,124	$ 537,001	$ 891,477	$ 562,605
Capital Reserve Fund	$ -	$ 350,000	$ 200,000	$ 250,000	$ 300,000	$ 200,000	$ 250,000
COMBINED ENDING BALANCE	**$ 2,104,705**	**$ 1,739,517**	**$ 1,965,271**	**$ 1,270,818**	**$ 1,736,275**	**$ 1,992,344**	**$ 1,732,028**

Summary	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Rate Revenue	$ 2,511,145	$ 2,662,566	$ 2,782,914	$ 2,880,734	$ 2,961,726	$ 3,044,995	$ 3,130,605	$ 3,218,622	$ 3,309,113	$ 3,402,149
Rate Funded Capital	$ 482,133	$ 552,452	$ 723,629	$ 550,925	$ 712,569	$ 731,197	$ 750,349	$ 860,827	$ 822,469	$ 844,187
Rate Increases	**3.65%**	**4.00%**	**4.00%**	**3.00%**	**2.30%**	**2.30%**	**2.30%**	**2.30%**	**2.30%**	**2.30%**
Monthly Rate / EBU	**$ 14.76**	**$ 15.35**	**$ 15.96**	**$ 16.44**	**$ 16.82**	**$ 17.21**	**$ 17.60**	**$ 18.01**	**$ 18.42**	**$ 18.85**

Exhibit 4: Surface Water Revenue Requirement Forecast: Service Level 3

Revenue Requirement	2014	2015	2016	2017	2018	2019	2020
Revenues							
Rate Revenues Under Existing Rates	$ 2,410,663	$ 2,422,716	$ 2,470,005	$ 2,482,355	$ 2,494,767	$ 2,507,241	$ 2,519,777
Non-Rate Revenues	289,270	335,454	319,751	320,888	322,106	323,276	324,463
Total Revenues	**$ 2,699,933**	**$ 2,758,170**	**$ 2,789,756**	**$ 2,803,243**	**$ 2,816,873**	**$ 2,830,517**	**$ 2,844,240**
Expenses							
Cash Operating Expenses	$ 2,451,376	$ 2,407,041	$ 2,411,206	$ 2,452,286	$ 2,494,174	$ 2,536,888	$ 2,580,445
Existing Debt Service	1,020	1,020	1,020	1,020	1,020	-	-
New Debt Service	-	-	-	-	-	-	-
Rate Funded Transfer to Capital Fund	486,455	482,133	602,675	651,305	809,474	954,726	1,049,878
Rate Funded Transfer to Capital Reserve Fund	-	-	-	50,000	50,000	50,000	50,000
Additions to Meet Required Operating Reserve	-	-	-	-	-	-	9,032
Total Expenses	**$ 2,938,851**	**$ 2,890,194**	**$ 3,014,901**	**$ 3,154,610**	**$ 3,354,668**	**$ 3,541,614**	**$ 3,689,354**
Net Surplus (Deficiency) Before Rate Increase	**$ (238,918)**	**$ (132,023)**	**$ (225,146)**	**$ (351,368)**	**$ (537,796)**	**$ (711,097)**	**$ (845,114)**
Additions to Meet Coverage	-	-	-	-	-	-	-
Total Surplus (Deficiency) Before Rate Increase	**$ (238,918)**	**$ (132,023)**	**$ (225,146)**	**$ (351,368)**	**$ (537,796)**	**$ (711,097)**	**$ (845,114)**
ANNUAL RATE INCREASE	**0.00%**	**3.65%**	**6.00%**	**6.00%**	**6.00%**	**6.00%**	**5.00%**
CUMULATIVE RATE INCREASE	**0.00%**	**3.65%**	**9.87%**	**16.46%**	**23.45%**	**30.86%**	**37.40%**
Rate Revenues After Rate Increase	$ 2,410,663	$ 2,511,145	$ 2,713,770	$ 2,890,979	$ 3,079,760	$ 3,280,868	$ 3,462,136
Additional Taxes from Rate Increase	$ -	$ 6,632	$ 18,282	$ 30,647	$ 43,874	$ 58,022	$ 70,677
Net Cash Flow After Rate Increase	**$ (238,918)**	**$ (50,226)**	**$ 337**	**$ 26,609**	**$ 3,323**	**$ 4,509**	**$ 26,568**
Bond Coverage After Rate Increases	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**
Sample Monthly Bill per EBU [a]	**$ 14.24**	**$ 14.76**	**$ 15.65**	**$ 16.58**	**$ 17.58**	**$ 18.63**	**$ 19.57**
Average Monthly Increase ($)	$ -	$ 0.52	$ 0.89	$ 0.94	$ 1.00	$ 1.05	$ 0.93

[a] 1 EBU = 3,450 impervious sq. ft. Before taxes.

Projected Ending Fund Balance	2014	2015	2016	2017	2018	2019	2020
Operating Fund	$ 914,168	$ 863,942	$ 864,279	$ 890,888	$ 894,211	$ 898,719	$ 934,319
Capital Fund	$ 1,190,537	$ 525,575	$ 955,114	$ 291,149	$ 895,045	$ 735,112	$ 521,911
Capital Reserve Fund	$ -	$ 350,000	$ 200,000	$ 250,000	$ 300,000	$ 200,000	$ 250,000
COMBINED ENDING BALANCE	**$ 2,104,705**	**$ 1,739,517**	**$ 2,019,393**	**$ 1,432,037**	**$ 2,089,256**	**$ 1,833,831**	**$ 1,706,230**

Summary	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Rate Revenue	$ 2,511,145	$ 2,713,770	$ 2,890,979	$ 3,079,760	$ 3,280,868	$ 3,462,136	$ 3,653,419	$ 3,756,135	$ 3,861,739	$ 3,970,311
Rate Funded Capital	$ 482,133	$ 602,675	$ 701,305	$ 859,474	$ 1,004,726	$ 1,099,878	$ 1,175,194	$ 1,109,492	$ 1,176,840	$ 1,208,522
Rate Increases	**3.65%**	**6.00%**	**6.00%**	**6.00%**	**6.00%**	**5.00%**	**5.00%**	**2.30%**	**2.30%**	**2.30%**
Monthly Rate / EBU	**$ 14.76**	**$ 15.65**	**$ 16.58**	**$ 17.58**	**$ 18.63**	**$ 19.57**	**$ 20.54**	**$ 21.02**	**$ 21.50**	**$ 21.99**

Exhibit 5: Surface Water Revenue Requirement Forecast: Service Level 4

Revenue Requirement	2014	2015	2016	2017	2018	2019	2020
Revenues							
Rate Revenues Under Existing Rates	$ 2,410,663	$ 2,422,716	$ 2,470,005	$ 2,482,355	$ 2,494,767	$ 2,507,241	$ 2,519,777
Non-Rate Revenues	289,270	335,454	320,349	321,847	323,045	324,333	325,555
Total Revenues	**$ 2,699,933**	**$ 2,758,170**	**$ 2,790,354**	**$ 2,804,202**	**$ 2,817,812**	**$ 2,831,574**	**$ 2,845,331**
Expenses							
Cash Operating Expenses	$ 2,451,376	$ 2,520,964	$ 2,528,461	$ 2,571,901	$ 2,616,198	$ 2,661,370	$ 2,707,434
Existing Debt Service	1,020	1,020	1,020	1,020	1,020	-	-
New Debt Service	-	-	-	-	-	-	-
Rate Funded Transfer to Capital Fund	486,455	458,026	477,118	809,907	1,077,849	1,379,218	1,588,344
Rate Funded Transfer to Capital Reserve Fund	-	-	-	50,000	50,000	50,000	50,000
Additions to Meet Required Operating Reserve	-	-	115,339	2,975	10,978	-	1,518
Total Expenses	**$ 2,938,851**	**$ 2,980,010**	**$ 3,121,937**	**$ 3,435,802**	**$ 3,756,045**	**$ 4,090,588**	**$ 4,347,296**
Net Surplus (Deficiency) Before Rate Increase	**$ (238,918)**	**$ (221,840)**	**$ (331,583)**	**$ (631,601)**	**$ (938,233)**	**$ (1,259,014)**	**$ (1,501,964)**
Additions to Meet Coverage	-	-	-	-	-	-	-
Total Surplus (Deficiency) Before Rate Increase	**$ (238,918)**	**$ (221,840)**	**$ (331,583)**	**$ (631,601)**	**$ (938,233)**	**$ (1,259,014)**	**$ (1,501,964)**
ANNUAL RATE INCREASE	**0.00%**	**3.65%**	**11.00%**	**11.00%**	**11.00%**	**9.00%**	**8.00%**
CUMULATIVE RATE INCREASE	**0.00%**	**3.65%**	**15.05%**	**27.71%**	**41.75%**	**54.51%**	**66.87%**
Rate Revenues After Rate Increase	$ 2,410,663	$ 2,511,145	$ 2,841,778	$ 3,170,145	$ 3,536,455	$ 3,874,010	$ 4,204,850
Additional Taxes from Rate Increase	$ -	$ 6,632	$ 27,883	$ 51,584	$ 78,127	$ 102,508	$ 126,381
Net Cash Flow After Rate Increase	**$ (238,918)**	**$ (140,043)**	**$ 12,307**	**$ 4,605**	**$ 25,329**	**$ 5,248**	**$ 56,729**
Bond Coverage After Rate Increases	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**
Sample Monthly Bill per EBU [a]	**$ 14.24**	**$ 14.76**	**$ 16.38**	**$ 18.19**	**$ 20.19**	**$ 22.00**	**$ 23.76**
Average Monthly Increase ($)	$ -	$ 0.52	$ 1.62	$ 1.80	$ 2.00	$ 1.82	$ 1.76

[a] 1 EBU = 3,450 impervious sq. ft. Before taxes.

Projected Ending Fund Balance	2014	2015	2016	2017	2018	2019	2020
Operating Fund	$ 914,168	$ 774,125	$ 901,771	$ 909,351	$ 945,657	$ 950,905	$ 1,009,152
Capital Fund	$ 1,190,537	$ 501,468	$ 819,255	$ 249,880	$ 653,217	$ 289,819	$ 499,522
Capital Reserve Fund	$ -	$ 350,000	$ 200,000	$ 250,000	$ 300,000	$ 200,000	$ 250,000
COMBINED ENDING BALANCE	**$ 2,104,705**	**$ 1,625,593**	**$ 1,921,025**	**$ 1,409,230**	**$ 1,898,874**	**$ 1,440,724**	**$ 1,758,674**

Summary	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Rate Revenue	$ 2,511,145	$ 2,841,778	$ 3,170,145	$ 3,536,455	$ 3,874,010	$ 4,204,850	$ 4,479,427	$ 4,605,366	$ 4,734,846	$ 4,867,966
Rate Funded Capital	$ 458,026	$ 477,118	$ 859,907	$ 1,127,849	$ 1,429,218	$ 1,638,344	$ 1,900,134	$ 1,976,154	$ 2,030,308	$ 2,085,984
Rate Increases	**3.65%**	**11.00%**	**11.00%**	**11.00%**	**9.00%**	**8.00%**	**6.00%**	**2.30%**	**2.30%**	**2.30%**
Monthly Rate / EBU	**$ 14.76**	**$ 16.38**	**$ 18.19**	**$ 20.19**	**$ 22.00**	**$ 23.76**	**$ 25.19**	**$ 25.77**	**$ 26.36**	**$ 26.97**

Exhibit 6: Service Level Matrix (2016 Projected Rates)

SERVICE LEVEL	PROGRAM ELEMENT				
	Planning & Engineering	Inspections & Maintenance	NPDES	Administration	Capital Improvement Projects
Program Element Function	• Staff salaries, supplies, and specific labor required for stormwater engineering and planning (stormwater comprehensive plan, annual NPDES reports, etc.).	• Routine system inspections and maintenance (includes NPDES-required): field crew staff salaries, equipment, interfund transfers for repairs, etc.	•Implementation of NPDES Permit program: monitoring, permit fees, public outreach, and program-specific administration. • SWMP document updates included under Planning & Engineering • Inspections & Maintenance included under I&M Category	• Overhead costs of operating the program: support staff salaries, state taxes, utility taxes, and non-element-specific expenses.	• Large-scale construction, expansion, renovation, or replacement projects; purchases of major, long-term use equipment; or major long-term maintenance, repair, or rehabilitation project.
$14.24	**$4.23**	**$5.23**	**$1.51**	**$0.91**	**$2.36**
Service Level 1	• Increased use of utility staff for CIP management	• Discontinue Pipe Program and reallocate staff and funds elsewhere • CCTV 15% of system annually until complete • Add 0.33 FTE to maintenance staff (as a back-up to maintain 2 full 2-person crews at all times)for non-NPDES inspections	• Establish Drainage Permit Fee • Add 0.33 FTE (maintenance) to increase NPDES inspection coverage area • Add 0.33 FTE (maintenance) to input backlog of inspection and maintenance records	• Charge Street Fund for waste disposal	• Addition of Capital Reserve Fund with beginning balance of $350,000. --- • Fund as many High Priority projects as possible, given inflationary rate increases of 2.3% / year
$15.10	**$2.66**	**$5.51**	**$1.63**	**$1.10**	**$4.19**
Service Level 2	• Increased use of utility staff for CIP management	• CCTV 15% of system annually until complete • Add 0.33 FTE to maintenance staff (as a back-up to maintain 2 full 2-person crews at all times)for non-NPDES inspections	• Establish Drainage Permit Fee • Add 0.33 FTE (maintenance) to increase NPDES inspection coverage area • Add 0.33 FTE (maintenance) to input backlog of inspection and maintenance records	• Charge Street Fund for waste disposal	• Addition of Capital Reserve Fund with beginning balance of $350,000. --- • Fund the same capital projects as Service Level 1
$15.35	**$2.66**	**$5.19**	**$1.63**	**$1.09**	**$4.78**
Service Level 3	• Increased use of utility staff for CIP management --- • Add 1.0 FTE (engineering) as customer growth permits to help manage CIP implementation. Estimated implementation year: 2021.	• CCTV 15% of system annually until complete • Add 0.33 FTE to maintenance staff (as a back-up to maintain 2 full 2-person crews at all times)for non-NPDES inspections	• Establish Drainage Permit Fee • Add 0.33 FTE (maintenance) to increase NPDES inspection coverage area • Add 0.33 FTE (maintenance) to input backlog of inspection and maintenance records	• Charge Street Fund for waste disposal	• Addition of Capital Reserve Fund with beginning balance of $350,000. --- • Fund all High Priority projects by end of study period.
$15.65	**$2.66**	**$5.19**	**$1.63**	**$1.12**	**$5.05**
Service Level 4	• Increased use of utility staff for CIP management --- • Add 1.0 FTE (engineering) immediately to help manage CIP implementation.	• CCTV 15% of system annually until complete • Add 0.33 FTE to maintenance staff (as a back-up to maintain 2 full 2-person crews at all times)for non-NPDES inspections	• Establish Drainage Permit Fee • Add 0.33 FTE (maintenance) to increase NPDES inspection coverage area • Add 0.33 FTE (maintenance) to input backlog of inspection and maintenance records	• Charge Street Fund for waste disposal	• Addition of Capital Reserve Fund with beginning balance of $350,000. --- • Fund all High Priority and Medium Priority projects by end of study period.
$16.38	**$3.14**	**$5.19**	**$1.63**	**$1.17**	**$5.25**

Exhibits 7-8 provide rate survey comparisons, estimating how the service level scenarios might compare to other jurisdictions in the future. **Exhibit 7** compares the City's existing rates (2014) with rates currently charged in other jurisdictions.

Exhibit 7: Comparative Surface Water Rate Survey - 2014

2014 Residential Rates	
Tacoma	$ 19.97
Auburn	$ 18.78
Redmond	$ 16.56
Normandy Park	$ 16.00
Kirkland	$ 15.60
Mercer Island	$ 15.32
Seattle	$ 15.08
Des Moines (Existing)	**$ 14.24**
Issaquah	$ 14.08
Burien	$ 12.79
Renton	$ 12.69
King County	$ 12.58
North Bend	$ 12.36
Bothell	$ 12.08
Bellevue	$ 11.82
Kent	$ 11.64
Tukwila	$ 9.83
Seatac	$ 8.30
Federal Way	$ 7.38
Woodinville	$ 7.26

Exhibit 8 compares the proposed City rate strategy in 2016 (inflation increase in 2015, scenario increases in 2016) with inflation adjusted rates at other jurisdictions, incorporating the City's current weighted average inflation assumption, 2.3% per year. This assumption reflects the idea that cost inflation will affect operating costs and construction costs in any jurisdiction. Without knowing the detail behind each utility's capital program, it is reasonable to assume that on average, other jurisdictions will respond to increased costs with a proportional increase in surface water rates.

Exhibit 8: Comparative Surface Water Rate Survey - 2016

2016 Residential Rates [a]	
Tacoma	$ 20.90
Auburn	$ 19.73
Redmond	$ 17.33
Normandy Park	$ 16.74
Des Moines (Scenario 4)	**$ 16.38**
Kirkland	$ 16.33
Mercer Island	$ 16.03
Seattle	$ 15.78
Des Moines (Scenario 3)	**$ 15.65**
Des Moines (Scenario 2)	**$ 15.35**
Des Moines (Scenario 1)	**$ 15.10**
Issaquah	$ 14.74
King County	$ 14.62
Renton	$ 13.28
Burien	$ 13.08
North Bend	$ 12.94
Bothell	$ 12.65
Bellevue	$ 12.37
Kent	$ 12.18
Seatac	$ 10.53
Tukwila	$ 10.29
Federal Way	$ 8.13
Woodinville	$ 7.60

[a] 2.3% annual inflationary increases applied to other utilities

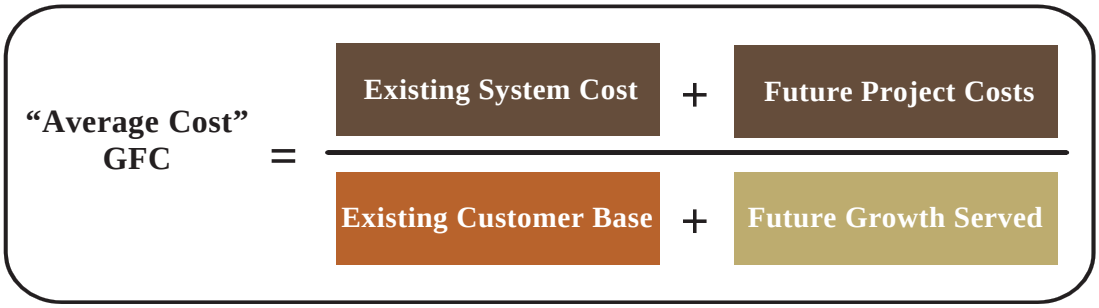
The rate surveys shown in **Exhibits 7-8** suggest that the City's current surface water rate is comparable to other utilities in the area – for all four service levels considered, the City's 2016 rate is expected to retain a similar relative ranking.

4.0 General Facilities Charge Update

General facilities charges (connection charges) are imposed as a condition of service on new customers connecting to the system. In addition to any other costs related to physically connecting a customer to the system, the GFC is typically based on a blend of historical and planned future capital investment in system infrastructure – its underlying premise is that growth (future customers) will pay for growth-related costs that the utility has incurred (or will incur) to provide capacity to serve new customers. The GFC cost basis excludes costs associated with assets funded by grants and developer contributions on the premise that a utility should not recover a cost that it did not incur.

Exhibit 9 summarizes the approach used to calculate general facilities charges in this study.

Exhibit 9: GFC Calculation Methodology



This "Average Cost" approach views the system from an aggregate perspective, acknowledging that existing and future facilities will benefit both existing and future customers. The cost basis for the charge includes both the cost of existing infrastructure and the cost of facilities planned for construction within the next ten years; the total allocable cost is divided by the total number of equivalent billing units (existing plus growth) to determine the average cost per unit. This method is relatively easy to implement and explain to customers. The following sections expand on the GFC methodology and calculation specifics.

4.1 Existing Facilities Cost Basis

The GFC existing cost basis includes costs associated with existing assets to recognize that those assets will provide benefit to new customers – per the City's most recent audited financial statements, 2013 constructed capital assets total approximately $20.2 million. The total cost of the system is adjusted to reflect:

- ***Contributed Capital:*** Any costs which the utility did not originally incur are deducted from the existing cost basis. The City has developer contributed assets totaling roughly $8.9 million (based on estimates from historical rate studies and financial statements) – resulting in $11.2 million in net utility-funded capital assets.

- ***10-Year Provision for Capital Retirements:*** The provision for capital retirements recognizes that some capital projects will replace assets that are currently included in the City's fixed asset

schedule. This adjustment intends to avoid double charging customers for an asset and its replacement concurrently, while accounting for the fact that assets are generally replaced at a cost that exceeds their original installation cost. The total adjustment is estimated to be between $1.3 million - $2.1 million, depending on the service level scenarios described in Section 2.4.

- ***Interest on Non-Contributed Assets***: In addition to the documented cost of existing assets, the City is allowed to recover a provision for interest accrued on those eligible assets. Conceptually, this interest provision (which is limited to ten years of interest accrual on each asset) attempts to account for opportunity costs that the City's customers incurred by supporting investments in infrastructure rather than having it available for investment or other uses. The total amount included for interest purposes is $3.6 million.

- ***Net Debt Principal Outstanding:*** Another adjustment to the existing system cost basis is to deduct the net liability of outstanding utility debt, recognizing that new customers will bear a proportionate share of this debt related to existing assets through their utility rates. Therefore, the cost of those assets charged to new development is offset to some degree by the remaining debt liability. Since the utility typically has cash resources that are not included in the system cost basis, the net debt load is defined as total debt minus outstanding cash and investments. As the surface water's only outstanding debt item is a small capital lease (copier), cash balances far outweigh debt service payments, and thus, there is no deduction to the GFC cost basis.

With these adjustments, the existing cost basis ranges from $12.8 million - $13.6 million, depending on the service level, as described in Section 2.4.

4.2 Future Facilities Cost Basis

The future cost basis was calculated with input from two sources which outline the City's surface water capital program: the 2015-2020 adopted CIP (provided by City staff) and the prioritized comprehensive plan CIP (provided by Parametrix). These two sources identify all potential capital projects in the ten-year planning period, listed in order of highest priority to lowest priority (high, medium, and low priorities). The service levels described in Section 2.4 include varying levels of future capital funding, resulting in a future cost basis ranging from $9.4 million to $14.8 million.

4.3 Customer Base

The customer base is separated into two groups: existing customers and expected customer growth.

- The existing customer base is based on the actual number of EBUs in the system during the 2012 rate study; totaling 14,311 EBUs.
- Growth in the customer base is estimated in the City budget at 0.50% per year, extrapolated for 20 years (2015-2034) to yield a 2034 customer base estimate of 15,812 EBUs. Although the project list utilizes a 10-year planning period, the improvements are expected to serve 20 years of growth.

4.4 GFC Calculation

Exhibit 10 summarizes the GFC calculation for all four service level scenarios using the components discussed above, differences may occur due to rounding.

Exhibit 10: GFC Calculation - Average Cost Approach

COST BASIS & CUSTOMER DATA	LOS 1	LOS 2	LOS 3	LOS 4
Existing Cost Basis				
Plant-In-Service				
Utility Capital Assets	$ 20,168,606	$ 20,168,606	$ 20,168,606	$ 20,168,606
less: Contributed Capital	(8,930,176)	(8,930,176)	(8,930,176)	(8,930,176)
plus: Interest on Non-Contributed Capital	3,624,027	3,624,027	3,624,027	3,624,027
less: 10-year Provision for Capital Retirements	(1,265,264)	(1,281,096)	(1,542,697)	(2,107,221)
less: Net Debt Principal Outstanding	-	-	-	-
Total Existing Cost Basis	**$ 13,597,193**	**$ 13,581,361**	**$ 13,319,760**	**$ 12,755,236**
Future Cost Basis				
Capital Improvement Plan				
Total Future Projects	$ 9,422,873	$ 9,422,873	$ 11,194,713	$ 14,808,267
less: Future Contributed Growth Related Assets	-	-	-	-
Total Future Cost Basis	**$ 9,422,873**	**$ 9,422,873**	**$ 11,194,713**	**$ 14,808,267**
Customer Base				
Existing Customer Base - # of Units	14,311 EBUs	14,311 EBUs	14,311 EBUs	14,311 EBUs
Future Customer Base (Incremental # of Units)	1,501 EBUs	1,501 EBUs	1,501 EBUs	1,501 EBUs
Total Customer Base	**15,812 EBUs**	**15,812 EBUs**	**15,812 EBUs**	**15,812 EBUs**

GFC CALCULATION	LOS 1	LOS 2	LOS 3	LOS 4
Existing Cost Component				
Total Costs	$ 13,597,193	$ 13,581,361	$ 13,319,760	$ 12,755,236
Allocable Customer Base	15,812	15,812	15,812	15,812
GFC per Unit - Existing Cost	**$ 860**	**$ 859**	**$ 842**	**$ 807**
Future Cost Component				
Total Costs	$ 9,422,873	$ 9,422,873	$ 11,194,713	$ 14,808,267
Allocable Customer Base	15,812	15,812	15,812	15,812
GFC per Unit - Future Cost	**$ 596**	**$ 596**	**$ 708**	**$ 937**
Total GFC per Unit	**$ 1,456**	**$ 1,455**	**$ 1,550**	**$ 1,743**

5.0 Recommendations

Key recommendations from the study include:

- Adopt a strategy of rate adjustments based on the Service Level 3 scenario. Based on discussions with Parametrix, this strategy would yield the following results:
  - Provide necessary maintenance staff to comply with regulatory maintenance requirements, improve operations efficiencies so that maintenance staff can inspect and maintain facilities simultaneously and proactively video inspect the City's existing infrastructure for prioritization of pipe replacement CIP spending.
  - Provide additional engineering staff when needed to deliver additional capital (estimated in 2021).
  - Improve capital spending by completing all High Priority projects over the next 10 years.
  - Improve system reliability and safety by preserving the City's voluntary pipe installation program and capital improvements that will replace approximately 40% of the City's aging CMP pipe over the next 10 years.
- Monitor the utility's financial position regularly, adjusting the rate strategy as needed based on anticipated costs.
- Increase the City's "general facilities" connection charge from $1,041 to the appropriate charge based on the selected scenario. This change is based on the Average Cost Approach, which defines the connection charge as a pro rata share of existing and planned future capital investments.
  - Service Level 1: $1,456 / EBU
  - Service Level 2: $1,455 / EBU
  - Service Level 3: $1,550 / EBU
  - Service Level 4: $1,743 / EBU

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Appendix F

Surface Water Management
2014 Budget

BUDGET NARRATIVE
2014

FUND: **SURFACE WATER MANAGEMENT UTILITY**
DEPARTMENT: **PLANNING, BUILDING AND PUBLIC WORKS**

Surface Water Management fund is accrued through the billing of property tax statements administered by King County. The County, as collection agency, distributes Surface Water Management fees to the City on a monthly basis. This fund is designated for maintenance of existing natural and man-made drainage features within the City of Des Moines.

		Projection 2013		Budget 2014
BEGINNING FUND BALANCE **	**$**	**1,256,487**	**$**	**1,153,086**
REVENUE				
Storm Drainage Fees	$	2,364,945	$	2,410,663
Partial Year Storm Drainage Fees		5,000		5,000
Utility Tax on Storm Drainage Fees		141,897		144,640
SWM - Engineering Plan Review Fees		49,299		43,630
Interest Income		2,500		3,000
Other Misc Charges		13,000		13,000
NPDES Grant		-		50,000
Salary CIP Reimbursement		15,000		30,000
REVENUE	**$**	**2,591,641**	**$**	**2,699,933**
OPERATING EXPENSES				
SWM Engineering	$	(771,061)	$	(1,060,661)
SWM Maintenance		(963,380)		(1,079,511)
SWM NPDES		(250,065)		(311,172)
Total Operating Expenses	**$**	**(1,984,506)**	**$**	**(2,451,344)**
TRANSFER-OUT TO FUND 451 (Annual Cash Available for capital projects and debt service)	$	(709,484)	$	(486,455)
TRANSFER-OUT TO FUND 220 (for Energy Savings Prog)		(1,052)	$	(1,052)
ENDING FUND BALANCE	**$**	**1,153,086**	**$**	**914,168**

* Hook-up Fees are receipted under SWM - Capital.

** Beginning Fund Balance to be maintained at a minimum of 33% (4 months) of Operating Expenses plus 7% to ensure positive balance before April collection of Storm Drainage fees.

CITY OF DES MOINES

SURFACE WATER MANAGEMENT REVENUE REQUIREMENTS

Revenue Requirements	2011 Actual	2012 Actual	2013 Estimate	2014 Forecast	2015 Forecast	2016 Forecast
Rate Revenues	$ 2,274,323	$ 2,308,392	$ 2,410,781	$ 2,464,059	$ 2,532,643	$ 2,603,140
Billing Correction						
Growth Factor (0.5% 2011-2014)				11,643	11,970	12,307
Total Rate Revenues	$ 2,274,323	$ 2,308,392	$ 2,410,781	$ 2,475,702	$ 2,544,613	$ 2,615,447
Monthly Rate (Residential Billing Unit)	$11.56	$11.85	$12.20	$14.24	$14.57	$14.90
Rate Increase						
ENR Cost Index - March	-0.80%	1.00%	3.60%	4.10%	3.00%	3.00%
Sea Consumer Price Index - June	-0.50%	3.20%	2.70%	1.40%	2.00%	2.00%
ENR Cost Index @ 30%	-0.24%	0.30%	1.08%	1.23%	0.90%	0.90%
Sea Consumer Price Index @ 70%	-0.35%	2.24%	1.89%	0.98%	1.40%	1.40%
Base Rate Increase	-0.59%	2.54%	2.97%	2.21%	2.30%	2.30%
Phase-in	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CPI correction/adjustments	0.59%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Rate Increase	**0.00%**	**2.54%**	**2.97%**	**2.21%**	**2.30%**	**2.30%**
Capital Contributions - Target	$ 682,297	$ 682,871	$ 709,484	$ 742,711	$ 763,384	$ 784,634
CIP Allocation from Rate Revenues	683,530	682,871	709,484	486,455	763,384	784,634
Utilize From Excess Operation Fund Balance	-		-	-	-	-
Total Capital Transfer	**$ 683,530**	**$ 682,871**	**$ 709,484**	**$ 486,455**	**$ 763,384**	**$ 784,634**
Capital Contribution (% of Rate Revenue)	30.05%	29.58%	29.43%	19.65%	30.00%	30.00%

The City Council on September 25, 2008 gave direction with adoption of Ordinance No. 1437 to adjust the current rate of $9.83 to $11.55 (per equivalent billing unit) for 2009 and include inflation rates thereafter. This approach in increasing rates would meet the "Moderate Level of Servicing" funding described in the rate study. The capital transfer would be maintained at 30% of total rate revenues beginning in 2009, yet allowing for the SWM Operation's beginning fund balance to build up to a 4-month plus 7% reserve (to ensure positive cash flow before the drainage fees are collected in April).

The City Council on August 8, 2013 gave direction with adoption of Ordinance No. 1574 to adjust the structure of the rates, resulting in an increase of the 2014 monthly residential charge to $13.93 but keeping the overall revenue of the utility neutral. The $14.24 residential rate shown above reflects a 2.21% inflation adjustment for 2014.

2014 transfer to CIP reduced by $250,000 to cover costs for Stormwater Comprehensive Plan.

CITY OF DES MOINES **2014 BUDGET REQUEST** **PLANNING, BUILDING, AND PUBLIC WORKS**
SURFACE WATER MANAGEMENT
ENGINEERING

450.100.040	ENGINEERING	2012 ACTUAL	2013 ADOPTED	2013 AMEND	2013 ACTUAL Jan-June	2013 EST YR TOTAL	2014 DEPT REQ	2014 NEW REQUEST	2014 EXEC AMEND	2014 ADOPTED
531.10.10.00	SALARIES & WAGES	199,573	208,524	208,524	103,738	208,734	215,612		214,282	214,282
531.10.11.00	OVERTIME	-	2,000	2,000	-	1,000	2,000		2,000	2,000
531.10.19.00	COMP ABSENCE ACCRUAL (GASB 16)	801	-	-	-	-	-		-	-
531.10.10	SUB TOTAL	200,374	210,524	210,524	103,738	209,734	217,612	-	216,282	216,282
531.10.20.00	PERSONNEL BENEFITS	86,307	94,046	94,046	49,756	96,667	112,955		106,054	106,054
531.10.20.90	EMPLOYEE MED. CONTRIBUTION	(2,975)	(2,815)	(2,815)	(1,617)	(3,233)	(3,686)		(3,351)	(3,351)
531.10.21.00	UNIFORMS	-	-	-	101	-	-		-	-
531.10.20	SUB TOTAL	83,332	91,231	91,231	48,240	93,434	109,269	-	102,703	102,703
531.10.31.00	OFFICE/OPERATING SUPPLIES	1,604	2,500	2,500	540	2,000	2,500		2,500	2,500
531.10.32.01	UNLEADED FUEL (ISF)	1,448	1,860	1,860	645	1,291	1,365		1,365	1,365
531.10.35.00	SM TOOLS & EQUIPMENT	2,079	1,500	1,500	-	1,500	1,500		1,500	1,500
531.10.35.90	SM TOOLS & EQUIPMENT >$1,000<$5,000	-	3,500	3,500	-	-	3,500		3,500	3,500
531.10.30	SUB TOTAL	5,131	9,360	9,360	1,185	4,791	8,865	-	8,865	8,865
531.10.41.00	PROFESSIONAL SERVICES	57,707	93,200	93,200	49,712	55,000	73,200	250,000	323,200	323,200
531.10.41.32	JANITORIAL SERVICES	528	650	650	264	477	650		650	650
531.10.41.45	ADVERTISING	-	250	250	-	250	250		250	250
531.10.42.00	COMMUNICATIONS	1,389	1,450	1,450	240	520	611		611	611
531.10.43.00	TRAVEL	-	3,000	3,000	-	2,000	3,000		3,000	3,000
531.10.44.03	B & O TAX-STATE	43,586	45,123	45,123	22,392	41,052	42,000		42,000	42,000
531.10.44.05	UTILITY TAX	137,803	141,897	141,897	70,414	140,829	144,640		144,640	144,640
531.10.45.02	COPIER LEASE	953	975	975	956	1,196	1,200		1,200	1,200
531.10.47.00	UTILITIES	1,169	1,275	1,275	517	1,322	1,375		1,375	1,375
531.10.48.00	REPAIRS AND MAINTENANCE	-	1,000	1,000	-	1,000	1,000		1,000	1,000
531.10.49.00	MISCELLANEOUS	920	2,500	2,500	237	2,000	2,500		2,500	2,500
531.10.49.22	DUES, SCHOOLS, AND CONFERENCES	515	5,000	5,000	239	5,000	5,000		5,000	5,000
531.10.49.25	PRINTING AND BINDING	-	500	500	-	-	500		500	500
531.10.40	SUB TOTAL	244,569	296,820	296,820	144,971	250,646	275,926	250,000	525,926	525,926
531.10.99.00	INTERFUND ADMIN CHRGS.-GEN FUND	185,000	190,000	190,000	95,000	190,000	190,000		190,000	190,000
531.10.99.01	COMPUTER INTERFUND-MAINTENANCE	7,955	7,955	7,955	3,977	7,955	6,463		6,463	6,463
531.10.99.02	COMPUTER INTERFUND REPLACEMENT	1,548	1,553	1,553	777	1,553	1,775		1,775	1,775
531.10.99.05	INTERFUND INSURANCE	9,280	11,429	11,429	11,429	11,429	7,128		7,128	7,128
531.10.99.06	FACILITY REPAIR/REPLACEMENT	499	499	499	250	499	499		499	499
531.10.90	SUB TOTAL	204,282	211,436	211,436	111,433	211,436	205,865	-	205,865	205,865

450.100.040	ENGINEERING	2012 ACTUAL	2013 ADOPTED	2013 AMEND	2013 ACTUAL Jan-June	2013 EST YR TOTAL	2014 DEPT REQ	2014 NEW REQUEST	2014 EXEC AMEND	2014 ADOPTED
591.31.75.03	PRINCIPAL-COPIER CAPITAL LEASE	872	910	910	-	910	949		949	949
592.31.83.03	INTEREST-COPIER CAPITAL LEASE	148	110	110	-	110	71		71	71
594.31.64.00	EQUIPMENT	-	-	-	-	-	-	-	-	-
	SUB TOTAL	1,020	1,020	1,020	0	1,020	1,020	0	1,020	1,020
	TOTAL SWM ENGINEERING	738,708	820,391	820,391	409,566	771,061	818,557	250,000	1,060,661	1,060,661

BUDGET NARRATIVE

2014

FUND: **SURFACE WATER MANAGEMENT UTILITY**
DEPARTMENT: **PLANNING, BUILDING AND PUBLIC WORKS**
DIVISION: **ENGINEERING**

Account No.	Title	Narrative	Departmental Request	Executive Amendment	Adopted
450.100.040.531.10.00.00		**ENGINEERING**			
		SALARIES AND WAGES			
531.10.10.00	Salaries & Wages	This provides salaries & wages for the following staff: 0.15 PBPW Director 0.15 Administrative Assistant II 0.70 SWM Utility Manager 1.00 Engineering Technician I 0.50 Engineering Aide 0.30 GIS Analyst 2.80 FTE's (Remaining .3 FTE SWM Utility Manager is budgeted 0.1 FTE in 001.480 PBPW Engineering Services to perform duties related to environmental issues and utilities other than SWM and 0.2 FTE for the NPDES Permit program. The remaining 0.5 Engineering Aide is budgeted in the NPDES Permit program.)	$ 215,612	$ 214,282	$ 214,282
531.10.11.00	Overtime	Provides for overtime for staff.	2,000	2,000	2,000
		TOTAL SALARIES AND WAGES	**$ 217,612**	**$ 216,282**	**$ 216,282**
		PERSONNEL BENEFITS			
531.10.20.00	Personnel Benefits	Provides for benefits for surface water staff.	$ 112,955	$ 106,054	$ 106,054
531.10.20.90	Employee Med. Contribution	Employee's share of health insurance premium cost for spouse and/or dependents.	(3,686)	(3,351)	(3,351)
		TOTAL PERSONNEL BENEFITS	**$ 109,269**	**$ 102,703**	**$ 102,703**

BUDGET NARRATIVE

2014

FUND: **SURFACE WATER MANAGEMENT UTILITY**
DEPARTMENT: **PLANNING, BUILDING AND PUBLIC WORKS**
DIVISION: **ENGINEERING**

Account No.	Title	Narrative			Departmental Request	Executive Amendment	Adopted
450.100.040.531.10.00.00		**ENGINEERING**					
		SUPPLIES					
531.10.31.00	Office/Operating Supplies	Cost of office and operating supplies. Also includes office billing supplies, forms, computer paper, etc.			$ 2,500	$ 2,500	$ 2,500
		Office Supplies	$	880			
		Plotter Materials	$	250			
		Photo Processing	$	100			
		Plan copier materials	$	660			
		Misc	$	610			
		Total	$	2,500			
531.10.32.01	Unleaded Fuel	Gasoline for two cars.			$ 1,365	$ 1,365	$ 1,365
531.10.35.00	Small Tools and Equipment	Hand tools, field equipment, safety equipment.			$ 1,500	$ 1,500	$ 1,500
531.10.35.90	Small Tools and Equipment >$1,000<$5,000				$ 3,500	$ 3,500	$ 3,500
		TOTAL SUPPLIES			**$ 8,865**	**$ 8,865**	**$ 8,865**
		OTHER SERVICES AND CHARGES					
531.10.41.00	Professional Services	This line item includes outside professional services that may be required for site specific engineering, tests or analysis, such as surveying, soils reports and testing. It also pays for billing and collection services provided by King County.			$ 73,200	$ 323,200	$ 323,200
		K.C. Billing Services	$	14,700			
		K.C. Collection Services (1%)	$	21,500			
		2014 Stormwater Comprehensive Plan	$	250,000			
		Other Consultant Engineerng services	$	25,000			
		WRIA 9	$	12,000			
			$	73,200			

BUDGET NARRATIVE

2014

FUND: **SURFACE WATER MANAGEMENT UTILITY**
DEPARTMENT: **PLANNING, BUILDING AND PUBLIC WORKS**
DIVISION: **ENGINEERING**

Account No.	Title	Narrative			Departmental Request	Executive Amendment	Adopted
450.100.040.531.10.00.00		**ENGINEERING**					
531.10.41.32	Janitorial Services	Provides for janitorial services for 10% of the Public Works-Engineering Building.			$ 650	$ 650	$ 650
531.10.41.45	Advertising	Expenses for advertising position openings, project bids, and legal publications.			$ 250	$ 250	$ 250
531.10.42.00	Communications	Provides for postage, phone and fax service.			$ 611	$ 611	$ 611
		Wireless (field laptop)	$	536			
		Telephone Lines	$	-			
		Long Distance	$	75			
			$	611			
531.10.43.00	Travel	Travel expenses associated with training.			$ 3,000	$ 3,000	$ 3,000
531.10.44.03	B & O Taxes-State	Provides for 1.8 % B & O tax to State.			$ 42,000	$ 42,000	$ 42,000
531.10.44.05	Utility Tax	Provides for 6% utility tax to City.			$ 144,640	$ 144,640	$ 144,640
531.10.45.02	Copier Lease	One-half copier, shared with Engineering			$ 1,200	$ 1,200	$ 1,200
531.10.47.00	Utilities	Provides for 10% of the utilities for the Public Works-Engineering Building:			$ 1,375	$ 1,375	$ 1,375
531.10.47.01		Electric	$	948			
531.10.47.02		Water	$	95			
531.10.47.03		Sewer	$	71			
531.10.47.06		Natural Gas	$	261			
			$	1,375			
531.10.48.00	Repairs And Maintenance	Expenses for repairs and adjustments to SWM engineering office equipment/instruments.			$ 1,000	$ 1,000	$ 1,000
531.10.49.00	Miscellaneous	Minor expenses not otherwise categorized.			$ 2,500	$ 2,500	$ 2,500

BUDGET NARRATIVE

2014

FUND: **SURFACE WATER MANAGEMENT UTILITY**
DEPARTMENT: **PLANNING, BUILDING AND PUBLIC WORKS**
DIVISION: **ENGINEERING**

Account No.	Title	Narrative			Departmental Request	Executive Amendment	Adopted
450.100.040.531.10.00.00		**ENGINEERING**					
531.10.49.22	Dues, Schools and Conferences	ASCE Membership	$	300	$ 5,000	$ 5,000	$ 5,000
		WEF Membership	$	200			
		Professional Licenses	$	700			
		Subscriptions	$	300			
		Conferences/Registrations	$	2,000			
		Classes/Training*	$	1,500			
		Total	$	5,000			
		*Includes basic training, GIS classes, safety training for confined spaces, other permit and regulation training.					
531.10.49.25	Printing And Binding	Provides for printing costs of basin plans, project specifications and manuals, large maps, exact scale reductions, color copies, etc.			$ 500	$ 500	$ 500
		TOTAL OTHER SERVICES AND CHARGES			**$ 275,926**	**$ 525,926**	**$ 525,926**
		INTERFUND SERVICES					
531.10.99.00	Interfund Administrative Charge	Indirect charge for services.			$ 190,000	$ 190,000	$ 190,000
531.10.99.01	Computer Maintenance	Provides for Computer Maintenance.			$ 6,463	$ 6,463	$ 6,463
531.10.99.02	Computer Replacement	Provides for replacement of computer hardware assigned to SWM Engineering.			$ 1,775	$ 1,775	$ 1,775
531.10.99.05	Interfund Insurance	Division's contribution to the Self Insurance Fund.			$ 7,128	$ 7,128	$ 7,128
531.10.99.06	Facility Repair and Replacement	Provides for major repairs for City facilities.			$ 499	$ 499	$ 499
		TOTAL INTERFUND SERVICES			**$ 205,865**	**$ 205,865**	**$ 205,865**

BUDGET NARRATIVE

2014

FUND: **SURFACE WATER MANAGEMENT UTILITY**
DEPARTMENT: **PLANNING, BUILDING AND PUBLIC WORKS**
DIVISION: **ENGINEERING**

Account No.	Title	Narrative	Departmental Request	Executive Amendment	Adopted
450.100.040.531.10.00.00		**ENGINEERING**			
		DEBT SERVICES			
591.31.75.03	Principal-Copier Capital Lease		$ 949	$ 949	$ 949
592.31.83.03	Interest-Copier Capital Lease		$ 71	$ 71	$ 71
		TOTAL DEBT SERVICES	**$ 1,020**	**$ 1,020**	**$ 1,020**
		CAPITAL OUTLAY			
594.31.64.00	Equipment		$ -	$ -	$ -
		TOTAL CAPITAL OUTLAY	**$ -**	**$ -**	**$ -**
		TOTAL ENGINEERING	**$ 818,557**	**$ 1,060,661**	**$ 1,060,661**

CITY OF DES MOINES **2014 BUDGET REQUEST** **PLANNING, BUILDING, AND PUBLIC WORKS**
SURFACE WATER MANAGEMENT
MAINTENANCE

450.200.040	MAINTENANCE	2012 ACTUAL	2013 ADOPTED	2013 AMEND	2013 ACTUAL Jan-June	2013 EST YR TOTAL	2014 DEPT REQ	2014 EXEC AMEND	2014 ADOPTED
531.20.10.00	SALARIES & WAGES	347,627	394,941	394,941	190,864	391,912	372,757	370,368	370,368
531.20.11.00	OVERTIME	13,289	8,100	8,100	1,930	7,293	8,100	8,100	8,100
531.20.19.00	COMP ABSENCE ACCRUAL (GASB 16)	89	-		-	-	-	-	-
531.20.10	SUB TOTAL	361,005	403,041	403,041	192,795	399,206	380,857	378,468	378,468
531.20.20.00	PERSONNEL BENEFITS	125,654	159,361	159,361	71,236	142,619	170,404	162,948	162,948
531.20.20.90	EMPLOYEE MED. CONTRIBUTION	(1,484)	(2,356)	(2,356)	(806)	(1,613)	(2,955)	(2,810)	(2,810)
531.20.21.00	UNIFORMS	1,415	1,600	1,600	2,096	2,425	1,600		
531.20.20	SUB TOTAL	125,586	158,605	158,605	72,525	143,431	169,049	160,138	160,138
531.20.31.00	OFFICE SUPPLIES	1,872	2,000	2,000	939	2,000	2,000	2,000	2,000
531.20.31.21	REPAIR SUPPLIES	22,891	43,000	43,000	13,699	27,398	43,000	43,000	43,000
531.20.32.01	UNLEADED FUEL (ISF)	9,348	8,749	8,749	4,855	9,710	10,389	10,389	10,389
531.20.32.02	DIESEL FUEL (ISF)	21,737	23,390	23,390	13,504	27,008	26,406	26,406	26,406
531.20.35.00	SM TOOLS & EQUIPMENT	819	2,000	2,000	547	2,000	2,000	2,000	2,000
531.20.35.90	SMALL EQP >$1,000 <$5,000	-	5,000	5,000	-	-	5,000	5,000	5,000
531.20.30	SUB TOTAL	56,668	84,139	84,139	33,544	68,116	88,795	88,795	88,795
531.20.41.00	PROFESSIONAL SERVICES	62,331	87,500	87,500	66,167	87,500	90,600	90,600	90,600
531.20.41.32	JANITORIAL SERVICES	1,804	1,850	1,850	738	1,476	1,850	1,850	1,850
531.20.41.45	ADVERTISING	-	500	500	-	500	500	500	500
531.20.42.00	COMMUNICATIONS	2,003	2,050	2,050	1,481	2,959	3,048	3,048	3,048
531.20.43.00	TRAVEL EXPENSES	-	500	500	-	500	500	500	500
531.20.45.00	OPERATING RENTALS & LEASES	1,619	6,000	6,000	115	3,506	6,000	6,000	6,000
531.20.45.02	COPIER LEASE	55	75	75	129	56	260	260	260
531.20.47.00	UTILITIES	24,362	31,549	31,549	17,654	30,992	31,921	31,921	31,921
531.20.47.12	STREET SWEEPING DISPOSAL	12,609	22,500	22,500	1,568	14,168	22,500	22,500	22,500
531.20.48.00	REPAIRS & MTC (Vehicles & Equipment)	754	25,000	25,000	-	17,000	17,000	17,000	17,000
531.20.48.20	STREET SWEEPING	48,591	53,000	53,000	19,436	45,351	53,000	53,000	53,000
531.20.48.22	CONTRACTED DRAINAGE REPAIR	7,004	50,000	50,000	3,745	50,000	50,000	50,000	50,000
531.20.48.23	WEST NILE VIRUS MOSQUITO CONTROL	453	25,000	25,000	-	-	25,000	25,000	25,000
531.20.49.00	MISCELLANEOUS	133	3,800	3,800	133	500	500	500	500
531.20.49.20	LAUNDRY	1,737	3,100	3,100	441	1,111	1,500	1,500	1,500
531.20.49.22	DUES, SCHOOLS, & CONF	524	700	700	33	700	700	700	700
531.20.40	SUB TOTAL	163,978	313,124	313,124	111,639	256,318	304,879	304,879	304,879

450.200.040	MAINTENANCE	2012 ACTUAL	2013 ADOPTED	2013 AMEND	2013 ACTUAL Jan-June	2013 EST YR TOTAL	2014 DEPT REQ	2014 EXEC AMEND	2014 ADOPTED
531.20.99.01	COMPUTER MAINTENANCE	4,520	4,522	4,522	2,261	4,520	3,350	3,350	3,350
531.20.99.02	COMPUTER REPLACEMENT	1,111	1,115	1,115	558	1,111	1,118	1,118	1,118
531.20.99.03	EQUIPMENT RENTAL MAINTENANCE	32,944	42,120	42,120	21,060	32,944	38,120	38,120	38,120
531.20.99.04	EQUIPMENT RENTAL REPLACEMENT	35,262	49,094	49,094	24,547	35,262	79,500	79,500	79,500
531.20.99.05	INTERFUND INSURANCE	21,110	22,107	22,107	22,107	21,110	23,781	23,781	23,781
531.20.99.06	FAC REP AND REPLACEMENT	1,362	1,362	1,362	681	1,362	1,362	1,362	1,362
531.20.90	SUB TOTAL	96,309	120,320	120,320	71,214	96,309	147,231	147,231	147,231
594.31.64.00	EQUIPMENT								
	- Ford F450 Super Duty Truck	46,754	-	-	-	-	-	-	-
594.31.60	SUB TOTAL	46,754	-	-	-	-	-	-	-
	TOTAL SWM MAINTENANCE	850,300	1,079,229	1,079,229	481,717	963,380	1,090,811	1,079,511	1,079,511

BUDGET NARRATIVE

2014

FUND: **SURFACE WATER MANAGEMENT UTILITY**
DEPARTMENT: **PLANNING, BUILDING AND PUBLIC WORKS**
DIVISION **MAINTENANCE**

Account No.	Title	Narrative	Departmental Request	Executive Amendment	Adopted
450.200.040.531.20.00.00		**MAINTENANCE**			
		SALARIES AND WAGES			
531.20.10.00	Salaries & Wages	Provides for salaries and wages for staff. 0.30 PW & Parks Maintenance Superintendent 2.00 Senior Maintenance Workers (1.00) Senior Maintenance Worker - Moved to Parks Operations 4.00 Maintenance Workers 0.60 Asst. City Mechanic 5.90 FTE's	$ 372,757	$ 370,368	$ 370,368
531.20.11.00	Overtime	Provides for standby pay and overtime.	$ 8,100	$ 8,100	$ 8,100
		TOTAL SALARIES AND WAGES	**$ 380,857**	**$ 378,468**	**$ 378,468**
		PERSONNEL BENEFITS			
531.20.20.00	Personnel Benefits	Provides payroll related benefits for salary and overtime for the surface water management maintenance workers.	$ 170,404	$ 162,948	$ 162,948
531.20.20.90	Employee Med Contribution	Employee's share of health insurance premium cost for spouse and/or dependent/s.	$ (2,955)	$ (2,810)	$ (2,810)
531.20.21.00	Uniforms	Provided uniform replacement and annual purchase of steel-toed boots.	$ 1,600	$ -	$ -
		TOTAL PERSONNEL BENEFITS	**$ 169,049**	**$ 160,138**	**$ 160,138**

BUDGET NARRATIVE

2014

FUND: **SURFACE WATER MANAGEMENT UTILITY**
DEPARTMENT: **PLANNING, BUILDING AND PUBLIC WORKS**
DIVISION **MAINTENANCE**

Account No.	Title	Narrative		Departmental Request	Executive Amendment	Adopted
450.200.040.531.20.00.00		**MAINTENANCE**				
		SUPPLIES				
531.20.31.00	Office Supplies	Cost of office and operating supplies. Also includes billing supplies, forms, computer paper, etc.		$ 2,000	$ 2,000	$ 2,000
531.20.31.21	Repair Supplies	Cost of repair supplies, pipe, couplings, pit run gravel and safety supplies.		$ 43,000	$ 43,000	$ 43,000
531.20.32.01	Unleaded Fuel	Gasoline for pickup, backhoe, dump trucks.		$ 10,389	$ 10,389	$ 10,389
531.20.32.02	Diesel Fuel	Diesel fuel for pickup, backhoe, dump trucks.		$ 26,406	$ 26,406	$ 26,406
531.20.35.00	Small Tools & Equipment	Provides for small tools and equipment such as tapes, shovels, hand tools, small power saws, etc.		$ 2,000	$ 2,000	$ 2,000
531.20.35.90	Small Equipment >$1,000 <$5,000			$ 5,000	$ 5,000	$ 5,000
		TOTAL SUPPLIES		**$ 88,795**	**$ 88,795**	**$ 88,795**
		OTHER SERVICES AND CHARGES				
531.20.41.00	Professional Services	DM Creek Basin Projects OM Fund	$ 29,500	$ 90,600	$ 90,600	$ 90,600
		DM Creek Basin Projects RR Fund	$ 35,100			
		Lower DM Creek OM Fund	$ 15,000			
		City of Kent/Hwy 99 SWM Facility Maint	$ 5,000			
		Miscellaneous Prof Services	$ 6,000			
			$ 90,600			
531.20.41.32	Janitorial Services	Provides for janitorial services for Surface Water Management's share of the Public Works Service Center.		$ 1,850	$ 1,850	$ 1,850
531.20.42.00	Communications			$ 3,048	$ 3,048	$ 3,048

BUDGET NARRATIVE

2014

FUND: **SURFACE WATER MANAGEMENT UTILITY**
DEPARTMENT: **PLANNING, BUILDING AND PUBLIC WORKS**
DIVISION **MAINTENANCE**

Account No.	Title	Narrative	Departmental Request	Executive Amendment	Adopted
450.200.040.531.20.00.00		**MAINTENANCE**			
531.20.43.00	Travel	Travel, mileage, meals and lodging associated with professional training for maintenance personnel.	$ 500	$ 500	$ 500
531.20.44.02	Advertising	Expenses for advertising position openings, project bids and legal publications.	$ 500	$ 500	$ 500
531.20.45.00	Operating Leases and Rentals	Rental of heavy equipment for stream dredging and catch basin placement, or in the event of a major landslide, equipment that may be needed to support operations.	$ 6,000	$ 6,000	$ 6,000
531.20.45.02	Copier Lease	Provides for operating costs of copier for the department.	$ 260	$ 260	$ 260
531.20.47.00	Utilities	Dump fees for catch basin and ditch cleaning debris and liquids. In the event that Vactor waste was to be contaminated, disposal of this debris could be very costly. Also provides for 22% of the utilities for the Public Works/ Parks Service Center:	$ 31,921	$ 31,921	$ 31,921
531.20.47.01		Electric $ 3,034			
531.20.47.02		Water $ 1,992			
531.20.47.03		Sewer $ 100			
531.20.47.04		SWM $ 4,420			
531.20.47.09		Dirt Removel $ 13,085			
531.20.47.11		Vactor Waste $ 9,290			
		$ 31,921			
531.20.47.12	Street Sweeping Disposal		$ 22,500	$ 22,500	$ 22,500
531.20.48.00	Repair and Maintenance - Vehicles and Equipment	Contingency for outside repair and maintenance of vehicles and equipment that is not part of Equipment Rental budget, e.g., vibrator plate, trash dumps, generator, jackhammer, and other pneumatic tools.	$ 17,000	$ 17,000	$ 17,000

BUDGET NARRATIVE

2014

FUND: **SURFACE WATER MANAGEMENT UTILITY**
DEPARTMENT: **PLANNING, BUILDING AND PUBLIC WORKS**
DIVISION **MAINTENANCE**

Account No.	Title	Narrative	Departmental Request	Executive Amendment	Adopted
450.200.040.531.20.00.00		**MAINTENANCE**			
531.20.48.20	Repair and Maintenance - Street Sweeping	The City currently contracts for street sweeping. 3.3 miles of downtown streets are swept twice a month. All residential streets are swept once a month from February through October and twice a month from November through January.	$ 53,000	$ 53,000	$ 53,000
531.20.48.22	Repair and Maintenance - Drainage Repair	Outside contracted drainage repair. This account funds large drainage projects that the city crew cannot perform for various reasons (e.g., time or equipment limitations, lack of work crew experience).	$ 50,000	$ 50,000	$ 50,000
531.20.48.23	West Nile Virus Mosquito Control	Outside contracted services for mosquito control in response to the West Nile Virus.	$ 25,000	$ 25,000	$ 25,000
531.20.49.00	Miscellaneous	Provides for miscellaneous items not budgeted elsewhere.	$ 500	$ 500	$ 500
531.20.49.20	Laundry	Provides for laundry of uniforms of SWM maintenance.	$ 1,500	$ 1,500	$ 1,500
531.20.49.22	Dues, Schools, and Conferences	Training, tuition and professional memberships.	$ 700	$ 700	$ 700
		TOTAL OTHER SERVICES AND CHARGES	**$ 304,879**	**$ 304,879**	**$ 304,879**

BUDGET NARRATIVE

2014

FUND: **SURFACE WATER MANAGEMENT UTILITY**
DEPARTMENT: **PLANNING, BUILDING AND PUBLIC WORKS**
DIVISION **MAINTENANCE**

Account No.	Title	Narrative	Departmental Request	Executive Amendment	Adopted
450.200.040.531.20.00.00		**MAINTENANCE**			
		INTERFUND SERVICES			
531.20.99.01	Computer Maintenance	Provides for Computer Maintenance.	$ 3,350	$ 3,350	$ 3,350
531.20.99.02	Computer Replacement	Provides for replacement of computer hardware.	$ 1,118	$ 1,118	$ 1,118
531.20.99.03	Equipment Maintenance	Provides for the repair and maintenance of vehicles at the City garage.	$ 38,120	$ 38,120	$ 38,120
531.20.99.04	Equipment Replacement	Provides for contributions to the eventual replacement of SWM-owned vehicles.	$ 79,500	$ 79,500	$ 79,500
531.20.99.05	Insurance	Provides for proportional share of liability and property insurance.	$ 23,781	$ 23,781	$ 23,781
531.20.99.06	Fac Repair and Replacement	Provides for major repairs for City facilities.	$ 1,362	$ 1,362	$ 1,362
		TOTAL INTERFUND SERVICES	**$ 147,231**	**$ 147,231**	**$ 147,231**
		CAPITAL OUTLAY			
594.35.64.00	Equipment		$ -	$ -	$ -
		TOTAL CAPITAL OUTLAY	**$ -**	**$ -**	**$ -**
		TOTAL MAINTENANCE	**$ 1,090,811**	**$ 1,079,511**	**$ 1,079,511**

450.400.040	NPDES PERMIT PROGRAM	2012 ACTUAL	2013 ADOPTED	2013 AMEND	2013 ACTUAL Jan-June	2013 EST YR TOTAL	2014 DEPT REQ	2014 EXEC AMEND	2014 ADOPTED
531.40.10.00	SALARIES & WAGES	150,874	186,084	186,084	64,740	130,163	170,718	169,670	169,670
531.40.11.00	OVERTIME	-	900	900	-	-	900	900	900
531.40.10	SUB TOTAL	150,874	186,984	186,984	64,740	130,163	171,618	170,570	170,570
531.40.20.00	PERSONNEL BENEFITS	61,638	90,301	90,301	28,973	76,287	88,083	83,186	83,186
531.40.20.90	EMPLOYEE MED. CONTRIBUTION	(1,192)	(2,528)	(2,528)	(647)	(1,295)	(2,457)	(2,237)	(2,237)
531.40.20	SUB TOTAL	60,447	87,773	87,773	28,326	74,992	85,626	80,949	80,949
531.40.31.00	OFFICE/OPERATING SUPPLIES	423	400	400	131	200	500	500	500
531.40.35.00	SM TOOLS & EQUIPMENT	329	1,000	1,000	-	575	1,000	1,000	1,000
531.40.35.90	SM TOOLS & EQUIPMENT >$1,000<$5,000	-	5,000	5,000	-	-	5,000	5,000	5,000
531.40.30	SUB TOTAL	753	6,400	6,400	131	775	6,500	6,500	6,500
531.40.41.00	PROFESSIONAL SERVICES	15,081	15,000	15,000	-	4,000	15,000	15,000	15,000
531.40.43.00	TRAVEL EXPENSES	12	500	500	-	500	500	500	500
531.40.49.00	MISCELLANEOUS	-	5,000	5,000	-	725	5,000	5,000	5,000
531.40.49.15	NPDES PERMIT FEE	15,530	16,000	16,000	7,944	16,285	16,500	16,500	16,500
531.40.49.22	DUES, SCHOOLS AND CONFERENCE	184	1,500	1,500	-	1,500	1,500	1,500	1,500
531.40.40	SUB TOTAL	30,807	38,000	38,000	7,944	23,010	38,500	38,500	38,500
531.40.99.01	COMPUTER INTERFUND-MAINTENANCE	9,389	6,556	6,556	3,278	6,556	5,384	5,384	5,384
531.40.99.02	COMPUTER INTERFUND REPLACEMENT	1,667	1,115	1,115	558	1,115	1,118	1,118	1,118
531.40.99.05	INTERFUND INSURANCE	10,009	5,804	5,804	5,804	5,804	8,151	8,151	8,151
531.40.90	SUB TOTAL	21,065	13,475	13,475	9,640	13,475	14,653	14,653	14,653
594.38.64.00	EQUIPMENT-Cityworks Program	84,882	-	-	7,650	7,650		-	-
594.31.64.00	EQUIPMENT-GPS Mapping Tool	-	-	-	-	-	-	-	-
594.31.60	SUB TOTAL	84,882	-	-	7,650	7,650	-	-	-
	TOTAL NPDES PERMIT PROGRAM	348,826	332,632	332,632	118,431	250,065	316,897	311,172	311,172
	TOTAL SWM MAINTENANCE	850,300	1,079,229	1,079,229	481,717	963,380	1,090,811	1,079,511	1,079,511
	TOTAL SWM ENGINEERING	738,708	820,391	820,391	409,566	771,061	818,557	1,060,661	1,060,661
	TOTAL SWM ENGR, MAINT & NPDES	1,937,834	2,232,252	2,232,252	1,009,714	1,984,506	2,226,265	2,451,344	2,451,344
	TRANSFER-OUT/FUND 220	657	657	657	149	1,052	1,052	1,052	1,052
	TRANSFER-OUT/CAPITAL	682,871	709,484	709,484	354,742	709,484	486,455	486,455	486,455
	TOTAL INCLUDING TRANSFERS	2,621,363	2,942,393	2,942,393	1,364,605	2,695,042	2,713,772	2,938,851	2,938,851
	ENDING FUND BALANCE	1,256,487	936,203	936,203		1,153,086	914,168	914,168	914,168
	TOTAL INCLUDING EFB	3,877,850	3,878,596	3,878,596	1,364,605	3,848,128	3,627,940	3,853,019	3,853,019

BUDGET NARRATIVE

2014

FUND: **SURFACE WATER MANAGEMENT**
DEPARTMENT: **PLANNING, BUILDING AND PUBLIC WORKS**
DIVISION: **NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT PROGRAM**

Account No.	Title	Narrative	Departmental Request	Executive Amendment	Adopted
450.400.040.538.31.00.00		**NPDES PERMIT PROGRAM**			
		SALARIES AND WAGES			
531.40.10.00	Salaries & Wages	Provides for salaries and wages for: 0.20 SWM Utility Manager 0.60 Water Quality Specialist/Civil Engr I 0.50 Engineering Aide 1.00 Engineering Technician (Transportation Tech temporarily assigned to SWM) 2.30 FTE's (Remaining .4 FTE Water Quality Specialist/Civil Engr I is budgeted 001.480 PBPW Engineering Services)	$ 170,718	$ 169,670	$ 169,670
531.40.11.00	Overtime	Provides for overtime for staff.	$ 900	$ 900	$ 900
		TOTAL SALARIES AND WAGES	**$ 171,618**	**$ 170,570**	**$ 170,570**
		PERSONNEL BENEFITS			
531.40.20.00	Personnel Benefits	Provides for benefits for surface water staff.	$ 88,083	$ 83,186	$ 83,186
531.40.20.90	Employee Med. Contribution	Employee's share of health insurance premium cost for spouse and/or dependents.	$ (2,457)	$ (2,237)	$ (2,237)
		TOTAL PERSONNEL BENEFITS	**$ 85,626**	**$ 80,949**	**$ 80,949**

BUDGET NARRATIVE

2014

FUND: **SURFACE WATER MANAGEMENT**
DEPARTMENT: **PLANNING, BUILDING AND PUBLIC WORKS**
DIVISION: **NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT PROGRAM**

Account No.	Title	Narrative	Departmental Request	Executive Amendment	Adopted
450.400.040.538.31.00.00		**NPDES PERMIT PROGRAM**			
		SUPPLIES			
531.40.31.00	Office/Operating Supplies	Cost of office and operating supplies. Also includes office billing supplies, forms, computer paper, etc.	$ 500	$ 500	$ 500
531.40.35.00	Sm Tools & Equipment	Hand tools, field equipment, safety equipment.	$ 1,000	$ 1,000	$ 1,000
531.40.35.90	Sm Tools & Equipment >$1,000<$5,000		$ 5,000	$ 5,000	$ 5,000
		TOTAL SUPPLIES	**$ 6,500**	**$ 6,500**	**$ 6,500**
		OTHER SERVICES AND CHARGES			
531.40.41.00	Professional Services	This line item includes outside professional services that may be required for site specific NPDES Program, such as compliance, testing, consulting services, public outreach program, etc.	$ 15,000	$ 15,000	$ 15,000
531.40.43.00	Travel Expenses	Travel expenses associated with training.	$ 500	$ 500	$ 500
531.40.49.00	Miscellaneous	Minor expenses not otherwise categorized.	$ 5,000	$ 5,000	$ 5,000
531.40.49.15	NPDES Permit Fee	Provides for stormwater discharge permit fee.	$ 16,500	$ 16,500	$ 16,500
531.40.49.22	Dues, Schools And Conference	Provides basic training, NPDES seminars, other permit and regulation training.	$ 1,500	$ 1,500	$ 1,500
		TOTAL OTHER SERVICES AND CHARGES	**$ 38,500**	**$ 38,500**	**$ 38,500**

BUDGET NARRATIVE

2014

FUND: **SURFACE WATER MANAGEMENT**
DEPARTMENT: **PLANNING, BUILDING AND PUBLIC WORKS**
DIVISION: **NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT PROGRAM**

Account No.	Title	Narrative	Departmental Request	Executive Amendment	Adopted
450.400.040.538.31.00.00		**NPDES PERMIT PROGRAM**			
		INTERFUND SERVICES			
538.31.99.01	Computer Maintenance	Provides for Computer Maintenance.	$ 5,384	$ 5,384	$ 5,384
538.31.99.02	Computer Replacement	Provides for replacement of computer hardware.	$ 1,118	$ 1,118	$ 1,118
538.31.99.05	Interfund Insurance	Provides for proportional share of liability and property insurance.	$ 8,151	$ 8,151	$ 8,151
		TOTAL INTERFUND SERVICES	**$ 14,653**	**$ 14,653**	**$ 14,653**
		CAPITAL OUTLAY			
594.31.64.00	Equipment		$ -	$ -	$ -
		TOTAL CAPITAL OUTLAY	**$ -**	**$ -**	**$ -**
		TOTAL NPDES PERMIT PROGRAM	**$ 316,897**	**$ 311,172**	**$ 311,172**

BUDGET NARRATIVE

2014

FUND: **SURFACE WATER MANAGEMENT**
DEPARTMENT: **PLANNING, BUILDING AND PUBLIC WORKS**
DIVISION: **OPERATING TRANSFERS-OUT**

Account No.	Title	Narrative	Departmental Request	Executive Amendment	Adopted
450.300.040		**TRANSFERS OUT**			
597.31.00.00	Transfer-out/Fund 220	This is a transfer out to Fund 220 for SWM share of Energy Savings Program loan principal and interest.	$ 1,052	$ 1,052	$ 1,052
597.31.00.01	Transfer-out/Fund 450	This is a transfer out to Fund 451, which is maintained at 30% of total rate revenues.	$ 486,455	$ 486,455	$ 486,455
		TOTAL TRANSFERS	**$ 487,507**	**$ 487,507**	**$ 487,507**
		TOTAL SWM FUND EXPENDITURES	**$ 2,226,265**	**$ 2,451,344**	**$ 2,451,344**
450.000.000.508.80.00.00		Ending Fund Balance - Unreserved	**$ 914,168**	**$ 914,168**	**$ 914,168**
		TOTAL INCLUDING ENDING FUND BALANCE	**$ 3,627,940**	**$ 3,853,019**	**$ 3,853,019**