

6. FUNDING AND IMPLEMENTATION

This chapter summarizes funding and implementation of the Green River System Wide Improvement Framework Interim Report. SWIF implementation is organized to resolve PL 84-99 deficiencies based on the optimization of flood risk reduction and local implementation timing considerations. All PL 84-99 *Unacceptable* deficiency inspection items will be resolved through either a capital project or levee maintenance and operations, or engineering analysis that determines the deficiency to be acceptable. Structural and non-structural interim measures will be implemented as needed, to reduce risks in locations where a capital project or maintenance action is needed, but implementation is delayed.

Section 6.1 provides summary cost tables for three categories of Interim SWIF implementation: capital projects; maintenance and operations; and interim risk reduction measures. Interim SWIF implementation will primarily be funded by King County Flood Control District revenue, as supplemented by other leveraged funding sources. Revenue available to fund Interim SWIF implementation is summarized in section 6.2. This also includes other potential funding sources that may be leveraged to support implementation. Section 6.3 focuses on implementation timing. Section 6.4 summarizes other considerations associated with Interim SWIF implementation specified in the 2011 SWIF policy.

6.1. Interim SWIF Cost Summary

Interim SWIF implementation costs are summarized according to three categories: (1) capital projects that resolve slope stability deficiencies, are designed to a 500-year level of protection in specific locations and support future certification (Chapter 3); (2) maintenance and operations programmatic tasks needed to resolve other PL 84-99 deficiencies (Chapter 2 and Chapter 4); and (3) interim risk reduction measures, including both structural and non-structural actions to reduce flood risks (Chapter 5). Categorical cost summary information is further described in Tables 6.1, 6.2 and 6.3. For additional descriptive information, please see referenced chapters.

Table 6-1 SWIF Capital Project Cost Estimates

Capital Project	Description	Implementation Costs (2018 Price Level)
Lower Russell Road RM 17.85 – 19.25 (right bank)	<ul style="list-style-type: none"> Setback levee, habitat restoration, and recreational/ park enhancements 	\$52 million
Tukwila 205: Segale-Gaco RM 15.55 – 15.88 (left bank)	<ul style="list-style-type: none"> Floodwall with toe/scour protection and riparian revegetation 	\$15.5-18.6 million
Tukwila 205: Ratolo	<ul style="list-style-type: none"> Floodwall with toe/scour protection and riparian revegetation 	\$7.1-8.4 million

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Capital Project	Description	Implementation Costs (2018 Price Level)
RM 14.6 – 14.75 (left bank)		
Tukwila 205: Christensen Rd.	<ul style="list-style-type: none"> Floodwall with toe/scour protection and riparian revegetation 	\$8.410.1 million
RM 13.43 – 13.58 (left bank)		
Horseshoe Bend: McCoy	<ul style="list-style-type: none"> Major modification for City of Kent secondary levee or in-place replacement levee 	\$0.4-5.3 million
RM 24.26 – 24.47 (right bank)		
Horseshoe Bend: Breda	<ul style="list-style-type: none"> In-place replacement levee and partial setback with toe/scour protection; riparian revegetation (including large shade trees) 	\$7.7-9.6 million
RM 24.47 – 24.7 (right bank)		
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TOTALS		\$91.1-104 million

Table 6-2 Programmatic Activities

Maintenance & Operations	Description	Cost (2018 Price level) (annual)	cost (one-time/periodic)
Vegetation	<ul style="list-style-type: none"> Brushing & mowing to support inspections (fall, before flood season) Hazard tree management (public safety and levee integrity) Establishment and maintenance of vegetation in the vicinity of levees and floodwalls 	\$516,000	n/a
Encroachments	<ul style="list-style-type: none"> Evaluation and correction of encroachments (fences, gates and other private 	\$45,000	\$222,000

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Maintenance & Operations	Description	Cost (2018 Price level) (annual)	cost (one-time/periodic)
	installations) on levees or their inspection zones		(document levee inspection zone property access authorities)
	<ul style="list-style-type: none"> Confirmation of access to levee inspection zones 		
Culverts	<ul style="list-style-type: none"> Evaluation and correction of outflows and flood closure devices located in the vicinity of levees Inspection of each device every 5 years 	\$90,000	n/a
Animal burrows	<ul style="list-style-type: none"> Complete pilot project and prepare response plan Ongoing inspections and management 	\$62,000	\$41,000
Assessments, surveys and monitoring	<ul style="list-style-type: none"> Site specific assessments by licensed engineers to verify effects of PL 84-99 deficiencies to levee integrity Ongoing levee system condition monitoring, twice per year 	\$163,000	n/a
TOTALS		\$876,000	\$263,000

Note: In addition to levee related costs included here, there are also Green River pump station (Black River, P-17 and Segale pump stations) annual O&M costs (including pump station operators) of approximately \$840,000.

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Table 6-3 Interim Risk Reduction Measures (IRRMs) Plan

IRRMs	Description	Cost (2018 price level) (annual)	cost (as needed or one-time in 6-year period)
<u>Structural IRRMs</u>			
Sandbags	Provision of sand bag materials in three sites: Tukwila, Kent and Auburn	\$9,000	-
Bulk bags	Installation and removal of bulk bags; bags provided by USACE	n/a	Variable (\$200,000/mile)
Earthen levee raising	Elevation of low spots in the levee system for emergency floodwater containment purposes (currently identified for Tukwila and Kent; Need further evaluation for Galli's/Dykstra levees in Auburn)	n/a	\$60-100/linear foot + acquisition costs, if necessary
Small capital for scour/erosion		n/a	\$2500-3500/linear foot for pilings and wood/rock buttress; \$650/foot for willow staking
Temporary rock placement		n/a	\$1000-2000/linear foot
<u>Non-structural IRRMs</u>			
Flood warning center	Countywide program cost	\$258,000	n/a
Flood patrol and inspection	Countywide program cost	\$196,000	n/a
Flood Plan	Cyclical (plan is updated every 5 years); Countywide flood plan costs	n/a	\$90,000
Communication	Countywide program cost	\$90,000	n/a
Emergency response, post flood recovery	Countywide program cost	n/a	Variable, depends upon # of flood events (\$58,000/flood event)
Technical studies and assistance	Countywide program cost	\$34,000	\$13,000

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		(prepare maps and report of PL 84-99 levee system low points)
TOTALS	\$676,000	N/A

6.2. REVENUE

Revenue to support implementation of the Interim SWIF includes King County Flood Control District managed funds and a variety of other potential grant sources. The King County Flood Control District's anticipated revenue for 2016 is \$56,000,000, which funds projects and programs countywide. The 6-year capital budget for the Green River from 2016-2021, including 2015 carryover, is approximately \$68 million. A separate maintenance budget will fund O&M costs, as shown in Table 6.2.

Other potential revenue sources that may be leveraged to support implementation of the Interim SWIF include:

- Corps of Engineers Continuing Authorities Program (section 205 funding)
- Corps of Engineers (Section 1135 of Water Resources Development Act of 1986) – Project modifications to improve the environment
- Corps of Engineers Ecosystem Restoration Program
- Corps of Engineers General Investigation
- National Estuary Program
- Floodplains by Design
- Salmon Recovery Funding Board
- WA State Legislature Direct Appropriation
- King County Mitigation Reserves Program
- King County Conservation Futures Tax
- Local cities






6.3. IMPLEMENTATION TIMING

Correcting PL 84-99 deficiencies is a cornerstone of the Flood Control District's flood risk reduction program within the Lower Green River. Slope stability deficiencies will be primarily resolved through SWIF capital projects. In locations where large capital projects are planned (e.g., Lower Russell), all other deficiencies in the capital project area will be corrected. Most of the remaining deficiencies will be corrected through levee maintenance and operations actions, or small capital projects. For example, it may be necessary for cities or private landowners to replace culverts or install backwater control. Table 6.4 highlights the implementation timeframe for capital projects and maintenance and operations tasks needed to resolve other deficiencies. Funding availability will govern the pace of implementation of capital projects needed to resolve slope stability deficiencies. Proposed capital project sequencing is guided by worst-first criteria and concepts of risk management.

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Table 6-4 Implementation Schedule

SWIF activity	2019	2020	2021	2022	2023	2024	2025	2026	2027
Lower Russell CIP									
HSB: Breda CIP									
Tuk205: Segale-Gaco CIP									
Tuk205: Ratolo CIP									
HSB: McCoy CIP									
Tuk205: Christensen CIP									
Programmatic Levee Maintenance & Operations*									
SWIF Progress Reports		★		★		★		★	

-  6-Year CIP that is partially funded and preliminary design could be initiated
-  6-Year CIP design + construction to correct PL 84-99 slope concerns
-  CIP, out years, to correct PL 84-99 slope stability deficiencies
-  PL 84-99 levee maintenance and operations*
-  SWIF implementation progress reports, submitted to USACE

6.4. IMPLEMENTATION CONSIDERATIONS

The 2011 policy governing SWIF preparation requires that local sponsors summarize known agreements that have the potential to influence implementation of the SWIF. A list of known agreements associated with the current PL 84-99 system of levees in the Lower Green includes:

- Lower Green River Flood Damage Reduction Project Operations and Maintenance Manual (1993) authorizing Tukwila as the local sponsor of the federal Tukwila 205 Project
- Interlocal agreement (Resolution Gr.194-1) between city of Tukwila and the Green River Flood Control District establishing maintenance responsibility for the Tukwila 205 Project
- Horseshoe Bend Flood Reduction Project agreement between United States of America and Green River Flood Control District; 1996
- Agreement for Levee Construction, Operation and Maintenance Briscoe-Desimone Levee between King County Flood Control District and Kent; 2013
- Cooperation Agreement Between the United States of America and The King County Flood Control District For Rehabilitation of a Non-Federal Flood Control Work Desimone-Briscoe School Levee, Job No. Grn-01-14; 2015
- Agreement for levee Construction, Operation and Maintenance for the Boeing Levee and Hawley Road Levee. Between King County Flood Control District and Kent; 2011

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- Revised Agreement for Levee Construction, Operation and Maintenance-Russell Road Upper Levee-North Reach and South Reach, between King County Flood Control District and Kent; 2015

The 2011 SWIF policy also requires that local sponsors inform FEMA regarding accredited levee systems that contain unacceptable inspection items, and, how these items will be addressed through SWIF implementation. King County Flood Control District will maintain ongoing communication with FEMA during SWIF implementation, to inform future FEMA mapping and accreditation projects. The Tukwila 205 levee is the only system in the Lower Green that was formerly certified through the Corps of Engineers. Tukwila is currently leading a levee certification process for the Tukwila 205 levee. Certification studies are anticipated to be completed in 2019, at which point unacceptable inspection items will be communicated to FEMA. SWIF implementation, as it relates to Tukwila 205, will be informed by these forthcoming technical studies and recommendations.

The King County Flood Control District proposes to submit bi-annual SWIF implementation progress reports to the Corps of Engineers, to document progress in resolving deficiencies and implementing the Interim SWIF through capital projects, maintenance and operations, and Interim Risk Reduction Measures.

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