



## **King County**

### **Water and Land Resources Division**

Department of Natural Resources and Parks

King Street Center

201 South Jackson Street, Suite 600

Seattle, WA 98104-3855

**206-296-6519** Fax 206-296-0192

TTY Relay: 711

December 19, 2012

Colonel Bruce Estok  
U.S. Corps of Engineers, Seattle District  
PO Box 3755  
Seattle, WA 98124-3755

Dear Colonel Estok:

Last month we transmitted the attached letter to you (Attachment A) that expressed our strong interest in developing a System Wide Improvement Framework (SWIF) for the Green River Levee System in collaboration with the Corps of Engineers, Seattle District (Corps of Engineers). We appreciate your immediate support and endorsement for us to proceed with a Letter of Intent (LOI). With this letter, we are now formally expressing our intent to develop a SWIF for the Green River Levee System and respectfully request your consideration and approval.

The development of a SWIF for the Green River Levee System will address key issues on the Green River including flood risk reduction facility and engineering deficiencies, levels of protection, capital project solutions, vegetation management, and habitat improvements. The SWIF will include the development of a prioritized list of capital projects as a key element of implementing a Strategic River Management Plan for the Green River with the goal to reduce risks to public health and safety, reduce public and private property damage from major-river flooding and channel migration, reduce maintenance costs, and improve aquatic habitat conditions, while protecting and maintaining the local economy. An additional goal of the SWIF is to meet the Corps of Engineers Operating & Maintenance standards. This would include meeting vegetation standards as set forth in ETL 1110-2-571: Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures or approved vegetation variances. We expect that vegetation variance requests may be initiated after the two year SWIF period concludes. The SWIF will be carried out using the best available technical information, an inclusive stakeholder process, and an analysis of risk and level of service issues. A preliminary draft scope of work to develop the SWIF over the two-year period following the Corps of Engineers' concurrence is included (please see Attachment B).

We also request that King County's Green River levees remain eligible for Corps of Engineers funding for any necessary levee repairs or rehabilitation under the PL 84-99 program while the SWIF is in development. The SWIF will allow King County to implement improvements that

address system-wide issues and correct unacceptable and minimally-acceptable inspection items from the most recent Periodic Inspection reports in a prioritized manner to optimize flood risk reduction throughout the Green River.

#### **Identification of Levees to be Covered by the SWIF**

A list of all levees identified in the Corps of Engineers April 2011 final Periodic Inspection as noted in the table below, generally located between Interstate 405 at River Mile 12.4 and State Route 18 at River Mile 33.3, are to be included and considered in the development of the SWIF. King County is the local sponsor and operates and maintains all the systems and segments listed in the table below, with the exception of the federal Tukwila 205. The City of Tukwila, Washington is the local sponsor for the Tukwila 205, however King County has operation and maintenance responsibility for the levee system through an interlocal agreement with the City of Tukwila. Further, the King County Flood Control District works to minimize flood risk throughout King County, both within and outside incorporated city boundaries, often in partnership with the cities' own efforts. Therefore, with support from the City of Tukwila, we propose to include the Tukwila 205 levee for consideration in the SWIF. We will involve the City of Tukwila, as well as several other Green River stakeholders, as collaborators in development of the SWIF. Please see Attachment C for the City of Tukwila's letter of support to include the Tukwila 205 in the SWIF process.

Additionally, we are requesting the inclusion of flood protection facilities in the Middle Green River as part of the initial SWIF scope. King County is also the local sponsor of these facilities and operates and maintains all the systems and segments. While the focus of the SWIF will be in the lower Green River basin, mitigation opportunities exist in the Middle Green River, and levee safety issues here may be an important consideration in a comprehensive flood management program. One of the early scope of work tasks will be to define the geographic scope for the SWIF in close coordination with the stakeholder group to define the upstream and downstream project extent. Please see Attachment D for a list of flood protection facilities in the Middle Green River Basin that we propose including in the SWIF at this time; however we acknowledge these facilities are not enrolled in the PL 84-99 program and will not be eligible for rehabilitation assistance as part of the SWIF.

The following table includes Lower Green River Levees and their eligibility status in the PL 84-99 program. The Tukwila 205 levee is rated as minimally acceptable and will become inactive in January 2013. Other levees rated as minimally acceptable will become inactive in April 2013. Because corrective actions will not be taken before these dates, these levees are included in the LOI. It should further be mentioned that any proposed alteration or modification to the two federal projects within the Green River system (Horseshoe Bend and Tukwila 205) as part of the SWIF will follow the Corps of Engineers' Section 408 process. Please see Attachment E for a map of the lower Green River levees.

<b>USACE System Name</b>	<b>National Levee Database System ID</b>	<b>Segment Name</b>	<b>National Levee Database Segment ID</b>	<b>Segment Length</b>	<b>PI Rating</b>	<b>Status</b>
Tukwila 205	5505000020	Tukwila	5504000020	4.1786	M	Eligible
Boeing/Desimone-Briscoe School	5505000043	Desimone – Briscoe School	5504000075	2.2024	U	In-eligible
Boeing/Desimone-Briscoe School	5505000043	Boeing	5504000045	0.8453	U	In-eligible
Lower-Upper Russell/Kent/Meyers	5505000158	Lower Russell Road-Holiday Kennel	5504000161	0.9427	U	In-eligible
Lower-Upper Russell/Kent/Meyers	5505000158	Upper Russell Road Somes-Dolan	5504000279	1.0287	U	In-eligible
Lower-Upper Russell/Kent/Meyers	5505000158	Kent Shops-Narita	5504000137	0.9325	M	Eligible
Lower-Upper Russell/Kent/Meyers	5505000158	Meyers Golf	5504000179	0.76	M	Eligible
Signature Point (County Road No. 8)	5505000068	Signature Point	5504000071	1.0795	U	In-eligible
Horseshoe Bend	5505000009	Horseshoe Bend	5504000009	1.8452	M	Eligible
Dykstra/Galli/Reddington	5505000078	Reddington	5504000236	0.9043	U	In-eligible
Dykstra/Galli/Reddington	5505000078	Galli	5504000102	0.2315	M	Eligible
Dykstra/Galli/Reddington	5505000078	Dykstra	5504000081	1.0514	M	Eligible

### **Brief Description of Deficiencies and Issues to be Covered Prior to Completion of the SWIF**

The Periodic Inspections identified numerous deficiencies that can be addressed through routine corrective actions including mowing, cutting of brush, removal of encroachments, and documentation that can be resolved in the near to mid-term, prior to the completion of the SWIF.

- 1.) Near Term: The periodic inspection reports observed blackberry vines and other invasive species that needed to be brushed and grasses mowed. In part, this was a result of focusing maintenance activities on higher flood risk reduction and repair activities due to several years with higher than normal flooding, and in part due to the difficulty of working around temporary advance measures lining 26 miles of Green River Levees due to seepage problems observed in January 2009 at Howard Hanson Dam. Since the documentation of the Periodic Inspections, King County's annual maintenance program is moving forward to address the majority of these mowing and brushing concerns. The Supersacks and HESCO barriers that made up the temporary advance measures were also noted as deficiencies impeding levee inspection. Notification that dam operations returned to normal was received from the Seattle District Corps Office in the fall of 2011 and the temporary advanced measures have been removed.
- 2.) Mid-Term: Other deficiencies that were noted in the Periodic Inspections included missing or incomplete documentation, and encroachments primarily consisting of park improvement structures. These types of issues will be discussed with the U.S. Corps of Engineers–Seattle District staff to be prioritized and addressed in the next 1-2 years while the SWIF is under development.

**Brief Description of Deficiencies and Issues to be Addressed through the SWIF**

Attachment A includes a preliminary draft scope of work for a Green River SWIF that describes the process for determining prioritization of deficiencies, both at the problem level (Task 5) and for implementation (Task 7), for the following three issues that cannot be accomplished through routine corrective actions:

- 1.) Engineering Deficiencies: The levee system in the Lower Green River is old and outdated. Even though levee repair and reconstruction has occurred in some places, the overall levee system still reflects its original purpose, which was protection of agricultural land, rather than the urban landscape that now fills the valley. Levee slopes are too steep with minimal scour protection at the toe, sloughing banks, continuing erosion and significantly degraded habitat. Due to the lack of contemporary design and construction standards from when the majority of the levees were built in the 1950s and 1960s, as well as rigorous documentation, the reliability and resiliency of the levee systems is uncertain. The work plan to develop the SWIF will include rigorous hydrologic, hydraulic and geotechnical studies needed to identify areas of deficiency and recommendations to implement any needed improvements. Risk-based prioritization of reconstruction and repair needs will also consider levee vegetation management issues.
- 2.) Natural Resource Consideration: Local jurisdictions throughout the Green River basin and Puget Sound area are responsible for implementing salmon recovery plans under the Endangered Species Act as well as complying with the federal Clean Water Act, FEMA's development standards under the Biological Opinion, and mitigating impacts that may result from flood control practices. These complex natural resource considerations require

additional time and coordination to ensure that levee safety and environmental protection are being adequately addressed, particularly around the issue of levee vegetation. Once the Corps of Engineers vegetation variance policy is finalized, King County will be in a position to request a variance from the permitting agencies in coordination with our stakeholders and the Muckleshoot Indian Tribe to maintain levee vegetation in accordance with applicable local, state and federal requirements.

- 3.) Periodic Inspection Reports: In 2010, the Corps of Engineers through its contractor, HDR/Jones and Stokes, conducted Periodic Inspections on the lower Green River levees. These periodic inspections only cover the Lower Green River Levees noted in the table above. The resulting Periodic Inspection Reports, which were finalized in October 2010, identified many issues of concern regarding eligibility of Green River levees for the PL 84-99 program. Six Green River levees along 6.4 miles were deemed ineligible and six levees along 9.0 miles were identified as minimally acceptable. Among the observations noted as deficiencies, 142 involve trees that exceed Seattle District Variance; 96 involve mowing or brushing of grasses or blackberry that we do annually; 37 involve animal burrows; 65 involve levee stability issues such as sloughing and erosion, most described as minor; and 73 involve encroachments (i.e., asphalt trails, picnic tables, a building, fences, signs, roads, power poles, sewer manholes, fire hydrants, drainage pump stations, bridges, and fishing shacks). The deficiencies identified in the Periodic Inspection Reports will be evaluated during the development of the SWIF to ensure they are corrected during implementation of the SWIF. Please see Attachment F for a summarized list of the deficiencies identified in the Periodic Inspection Reports for the levees to be covered by the SWIF.

### **Commitment of Non-Federal Resources**

In April of 2007, the King County Flood Control District was formed by the Metropolitan King County Council under the authority of Revised Code of Washington (RCW) Chapter 86.15. In forming the District, a property tax levy was authorized which is applied throughout the incorporated and unincorporated areas of King County; the 2012 levy collection is estimated at \$36.3 million. This funding mechanism supports the comprehensive, countywide flood risk reduction programs and ensures sufficient funding to address the maintenance, repair and reconstruction of King County's aging flood protection infrastructure. The Flood Control District's adopted budget commits \$46.6 million to Green River capital projects in the years 2013 through 2018. Currently, research is underway to assess additional funding opportunities through bonding if additional needs are identified through the SWIF process that cannot be covered through already committed levee funds.

An important and noteworthy component of the Flood Control District in setting forth its work program is its governance structure which includes its Board of Supervisors, an Executive Committee, Advisory Committee and Basin Technical Committees. This governance structure and its composition clearly demonstrate the commitment to address flood risk reduction throughout all of King County, and particularly in the Green River basin.

Board of Supervisors: The nine King County Council members serve as the Board of Supervisors. They are the District's governing body and provide decision making to guide regional policies, programs and projects.

Executive Committee: The Executive Committee is made up of four members of the Board of Supervisors, meets monthly, develops policy recommendations for consideration by the full Board and oversees the day-to-day business of the District.

Advisory Committee: The 15-member Advisory Committee consists mostly of elected officials from cities that have historically experienced significant flooding, the Suburban Cities Association, and large cities. This committee provides the Board of Supervisors with policy recommendations on regional flood protection, annual budgeting issues, and on priorities and implementation strategies for the Flood Control District's capital improvement program.

Basin Technical Committees: The Basin Technical Committees are made up of technical staff from local jurisdictions, represent each of King County's major river basins, including the Green River basin, and ensure that basin-scale issues and basin-specific technical information are considered in Flood Control District decision-making.

For day-to-day implementation of the Flood Control District's projects and programs, an Interlocal Agreement with King County was executed whereby the County functions as the service provider to the Flood Control District.

In addition to the Flood Control District funds, several other local and state programs are available to provide funding on a case-by-case basis, as follows:

Flood Control Assistance Account Program: The Washington State Legislature established the Flood Control Assistance Account Program in 1984 to help counties, cities, towns, and districts throughout Washington State reduce flood hazards and flood damage. The program, authorized under Chapter 86.26 RCW, is administered by the Department of Ecology, which emphasizes resource protection, fisheries restoration, integrated planning, growth management, watershed planning, and non-structural flood protection measures in an effort to foster watershed-based, multi-objective approaches to minimizing flood hazards. Eligible projects include acquisitions; flood protection infrastructure retrofits, setbacks and removals; floodplain and channel migration zone mapping studies; comprehensive flood hazard management planning; and flood emergency warning services. \$11 million in state capital funds in 2011 and 2012 have been provided to the Flood Control District through this program. These legislative appropriations have been for levee improvements at the Boeing, Hawley, and Briscoe-Desimone levees on the Green River. In 2010, the state provided another \$10 million to the City of Kent for improvements to the Horseshoe Bend levee.

Salmon Recovery Grant Program: Since 1999, the Salmon Recovery Grant Program, under the direction of the Salmon Recovery Funding Board, provides grant funds for projects that protect, preserve, restore, and enhance salmon habitat and watershed functions. Authorized under Chapter 77.85 RCW, the program is funded in part by state general obligation bonds. This program identifies and funds the most important habitat protection and restoration projects in a watershed and is guided by the best available science. Projects are prioritized based on anticipated benefits to Endangered Species Act listed salmon stocks, the certainty that the project will be successful in providing those benefits, and the cost relative to anticipated benefits. Emphasis is placed on projects aimed at restoring natural habitat-forming processes and addressing degraded conditions. Eligible projects include acquisitions and flood protection infrastructure retrofits, setbacks, and removals.

Conservation Futures Tax: Authorized under Chapter 84.34 RCW, conservation futures tax funds are collected from property taxes levied throughout King County and dedicated to the acquisition of open space and passive use lands in cities and rural areas. Annually, approximately \$6 to \$8 million is collected and allocated for acquisition. The acquisition component of multi-objective flood risk reduction projects have been funded with Conservation Futures Tax funds.

King County Mitigation Reserves Program: The King County Mitigation Reserves Program is a King County-sponsored fee-in-lieu mitigation program through which project sponsors whose projects create unavoidable impacts to aquatic resources can pay a mitigation fee in-lieu of completing their own mitigation. King County then uses fees to implement mitigation projects. The program complies with federal rules for compensatory mitigation issued in April 2008 by the Corps of Engineers and U.S. Environmental Protection Agency (EPA) [33 CFR Part 332 and 40 CFR Part 230].

### **Anticipated Interim Flood Risk Reduction Strategies**

Through the development of the SWIF, a wide range of flood risk reduction measures will continue to be implemented by King County in partnership with the lower Green River valley cities, the Muckleshoot Indian Tribe, King County citizens, state and federal agencies and other stakeholders. The measures include, but are not limited to, the following:

1. Flood Preparedness, Flood Warning and Outreach: King County's Flood Hazard Education and Flood Preparedness Program is designed to increase awareness of locally available resources and information to help citizens prepare for flood events and prevent, minimize and recover from flood damage. This includes operation of the regional Flood Warning Center which is responsible for the collection, analysis and dissemination of flood warning information to allow individuals and organizations to prepare for developing flood conditions and take appropriate actions to minimize flood damage and risks to health and safety. Many different agencies partner in the flood warning process, working together to provide high quality information essential to

public safety before and during flood events. The Flood Warning Center provides services to both unincorporated and incorporated areas, including the lower Green River valley in close partnership with the Corps of Engineers as part of their operations of Howard Hanson Dam. The Flood Warning Center includes more than sixty trained personnel performing the following activities in flood events:

- a. Collect and analyze flood warning information on river gage readings from the U.S. Geological Survey and Army Corps of Engineers, dam operations, weather forecasts and river crest predictions, road closures and filed conditions performed by flood patrols and citizen observations;
- b. Patrol, investigate and evaluate rivers and flood control facilities for potential and existing flood hazard sites. Assess, document and communicate hazards, recommended course of action and continue monitoring for changing conditions. Round-the-clock patrol of flood facilities is initiated under stage three flooding;
- c. Warn residents, businesses, property owners, and emergency response officials of potential and existing flooding conditions;
- d. Provide flood warning information through 24-hour telephone support, phone message system, flood alerts, the media, and internet; and
- e. Support emergency response activities such as sandbagging, evacuations, temporary housing, transportation and complaint investigations.

Detailed flood warning policies, procedures, and personnel responsibilities are included in the King County Flood Warning Instruction Book which is updated annually.

Additional measures that are taken to keep the public informed about flood risk include a flooding services and information website at:

<http://www.kingcounty.gov/environment/waterandland/flooding.aspx>. This website provides information to the public on topics such as, "How to Prepare for a Flood," important emergency phone numbers and resources, and sandbag distribution locations in King County. Citizens can sign up for flood warnings and alerts for major rivers and streams in King County, including the Green River, and can view floodplain boundaries in King County. Additional media outreach is provided through "Flood Awareness Month" and "Take Winter by Storm" public awareness campaigns with partnering agencies. Conditions of Green River facilities are included in the 2006 Flood Hazard Management Plan that is currently being updated. Public meetings were held earlier this month on the Flood Hazard Management Plan update and a second series of meetings will be held in January 2013.

2. Annual Maintenance and Inspection Activities Along Lower Green River Levees: King County performs maintenance for 138 existing levees and revetments along 36.4 miles of riverbank, three pump stations and related flood protection infrastructure. Along the lower Green River levees, King County will continue to carry out annual routine maintenance, including flood mowing, noxious weed control, installation and repair of access controls, and minor repair and maintenance of flood protection infrastructure and



related properties and appurtenances. Additionally, we will continue to implement our flood protection infrastructure inventory database program that includes routine inspection, condition assessment and monitoring for all levees, revetments, raised banks, pump stations, stormwater discharge structures, cross-culverts, closure structures and appurtenances.

3. Capital Improvement Program Implementation: The 6-year adopted Capital Improvement Program (2013-2018) for the Flood Control District will complete high priority and regionally significant flood hazard management projects to significantly protect public safety and reduce flood risks to the regional economy, transportation corridors, and public and private infrastructure and property. CIP Implementation in the Flood Control District's adopted 6-year CIP for the Lower Green River includes:

<b>Project Name</b>	<b>Description</b>	<b>Funding</b>
Black River Pump Station	Identify needs, update systems and conduct necessary maintenance in this aging pump station.	\$5,603,793
Boeing Levee USACE ERP	Funding towards the Boeing Levee Ecosystem Restoration Project. Work will address remaining toe and bank stabilization needs in this reach, and additional freeboard.	\$1,000,000
Briscoe Levee Setback	Rebuild priority segments of this aging levee reach with acquisition of sufficient easement area for reconstruction of levee to design standards.	\$22,845,224
Horseshoe Bend Acquisition and Reconstruction	Acquire key parcels needed to accommodate setback reconstruction of the levee in the NW quarter of the bend in a structurally stable position landward from the existing riverbank.	\$4,928,730
Lower Russell Repair	New project in 2013 to address containment risk associated with levee slump.	\$500,000
Reddington Reach Setback	Construct a new levee set back from the existing levee and riverbank, remove the existing levee, and extend levee protection northward.	\$12,151,321
Upper Russell Rd	Acquire key parcels needed to accommodate setback reconstruction of the secondary levee prism in a structurally stable position landward from the existing levee.	\$1,052,291

### **Interagency Collaborative Efforts**

King County has a long history of collaboration with stakeholders throughout the county. The development of the SWIF will necessitate even stronger, closer interagency collaboration and as part of the preliminary draft scope of work to develop the SWIF (see Attachment A), we will convene a Stakeholder Committee and develop a process to seek diverse and timely input on the development of the SWIF. The Stakeholder Committee will be represented by local, state and federal agencies, Native American Tribes and resource agencies including, but are not limited to, the following:

- King County Flood Control District
- National Marine Fisheries Service
- Muckleshoot Indian Tribe
- Puget Sound Partnership
- Washington State Department of Ecology
- Washington Department of Fish and Wildlife
- U.S. Fish and Wildlife
- Corps of Engineers
- Cities of Auburn, Kent, Tukwila and Renton
- Federal Emergency Management Agency

### **State and Federal Permits and Consultation Requirements**

In addition to working with the Corps of Engineers, King County will collaborate with a number of federal, state and local agencies and Native American Tribes during the development, implementation and oversight of the SWIF. The following list of anticipated state and federal permits and consultation requirements will be needed to implement the SWIF consistent with capital project implementation.

<b>Permit</b>	<b>Issuing/Regulating Agency</b>
Clean Water Act Section 404 Permit	Corps of Engineers
Rivers and Harbors Act Section 10 Permit	Corps of Engineers
Endangered Species Act Section 7 Consultation	National Marine Fisheries Service and U.S. Fish and Wildlife Service
LOMA/LOMR	Federal Emergency Management Agency
Clean Water Act Section 401 Water Quality Certification	Washington Department of Ecology
Coastal Zone Management Consistency Determination	Washington Department of Ecology
NPDES Permit	Washington Department of Ecology
Hydraulic Project Approval	Washington Department of Fish and Wildlife with Muckleshoot Indian Tribe concurrence
Shoreline Management Act Compliance	Local jurisdiction
Critical Areas compliance	Local jurisdiction
Clearing/Grading Permit	Local jurisdiction
Right of Way Construction	Local jurisdiction

Thank you for consideration of this request and for the Corps of Engineers support to move forward with the development of a System Wide Improvement Framework for the Green River Levee System. King County will bring together federal partners, the King County Flood District, state and local governments, the Muckleshoot Indian Tribe, and the business community in taking an integrated approach to risk-based assessment to evaluate levee reconstruction, repair and other appropriate flood safety strategies. We also believe this opportunity will help bring resolution to the continuing levee vegetation conflicts. We greatly appreciate your agency's assistance in helping cooperatively solve the public safety, economic sustainability and environmental challenges we face in our county.

Thank you for your continued support on this ground-breaking effort. If you have any questions, need additional information, or if you would like to discuss any of these issues further, please do not hesitate to me at 206-296-6587 or [mark.isaacson@kingcounty.gov](mailto:mark.isaacson@kingcounty.gov).

Sincerely,



Mark Isaacson  
Division Director

cc: The Honorable Dow Constantine, King County Executive  
Julia Patterson, Chair, King County Flood Control District  
King County Flood Control District Board of Supervisors  
The Honorable Peter Lewis, Mayor, City of Auburn  
The Honorable Suzette Cooke, Mayor, City of Kent,  
The Honorable Jim Haggerton, Mayor, City of Tukwila  
The Honorable Denis Law, Mayor, City of Renton  
Mark Carey, Director, Mitigation Division, Federal Emergency Management Agency  
Steve Landino, Director, Washington State Habitat Office, Habitat Conservation  
Division, National Marine Fisheries Service  
Isabel Tinoco, Executive Director, Muckleshoot Fisheries  
Anthony Wright, Executive Director, Puget Sound Partnership  
Jeannie Summerhays, Regional Director, Washington State Department of Ecology  
Kenneth Berg, Manager, Western Washington Field Office, U.S. Fish and Wildlife  
Mark Ohlstrom, Chief, Engineering Division, U.S. Army Corps of Engineers  
Kjristine Lund, Executive Director, King County Flood Control District  
Fred Jarrett, Deputy King County Executive, King County Executive's Office (KCEO)  
Carrie Cihak, Chief Advisor, Policy and Strategic Initiatives, KCEO  
Christie True, Director, Department of Natural Resources and Parks (DNRP)  
Steve Bleifuhs, Manager, River and Floodplain Management Section, DNRP, WLRD





**King County**

October 23, 2012

Colonel Bruce Estok  
U.S. Army Corps of Engineers, Seattle District  
PO Box 3755  
Seattle, WA 98124-3755

Dear Colonel Estok:

We are writing to express our strong interest in developing a System Wide Improvement Framework (SWIF) for the Green River Levee System in collaboration with the U.S. Army Corps of Engineers, Seattle District. We also want to thank you and your staff for the continued cooperation as we engage in solving long standing flood and environmental challenges in King County.

We see the Corp's new SWIF option as a way to bring together federal partners, the King County Flood District, local governments, Muckleshoot Indian Tribe, and the business community in taking an integrated approach to evaluating flood safety strategies. This evaluation would be based on risk, identify solutions, and coordinate a multi-objective river management effort. Successful application of the SWIF would help to align regulatory requirements, focus investments in levee improvements to reduce risk, and provide greater certainty about regulatory requirements and flood risk for local governments, as well as businesses making decisions about future investment. It would also enable us to more effectively address salmon recovery needs in both our near- and long-term plans for levee maintenance and reconstruction.

We know our levees need significant investment and reconstruction. In response, the King County Flood Control District is now considering a \$46.5 million six-year capital investment in our levees. The SWIF process would help us to prioritize our expenditures to those areas that are the most important to improve public safety, support economic development, and address salmon recovery needs. We would like to discuss with you the development of a SWIF that addresses at least five major areas:

- **Risk-Based Assessment of Levee Reconstruction and Repair Needs:** The levee system in the Lower Green River is old and outdated. Even though levee repair and reconstruction has occurred in some places, the basic system is still in place today. Levee slopes are too steep with minimal scour protection at the base, sloughing banks, continuing erosion and significantly degraded habitat. Because the Lower Green River channel is severely constrained by these levees, floodwaters are contained within a narrow area and peak flood levels can be as much as 20 feet above the elevation of the ordinary high water mark. This results in chronic undercutting erosion and slumping failures. Risk-based prioritization of reconstruction and repair needs would consider levee vegetation management issues.

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- **Desired Level of Flood Protection:** Although the recent repairs to the Howard Hanson Dam have addressed seepage at the dam, we have learned that the design capacity does not provide 500-year protection for the Green River Valley, as we once believed. The new estimate for the chance of a Howard Hanson Dam release exceeding 12,000 cubic feet per second at Auburn is 1 in 140, rather than the previously assumed 1 in 500. This relatively new information provides a more accurate indication of the actual flood risk, which increases from a six percent chance to a 19 percent chance of flooding in 30 years. This contributes to the business community concerns about the viability of long term investments in the valley. The SWIF process would help us to clarify appropriate and necessary flood protection levels.
- **Eligibility for Corps Funding:** We also want to remain eligible for Corps funding of levee improvements along the river. The U.S. Army Corps of Engineers 2010 Periodic Inspection on levees along the Green River identified many issues of concern regarding eligibility of Green River levees for the PL 84-99 program – including vegetation removal, buildings along the levee system that are too close to the levees and emergency access concerns with respect to the location of bollards and picnic tables.
- **Environmental Protection and Regulatory Alignment and Certainty:** We want to protect and improve the river environment. The Green River is important to the Puget Sound ecosystem, is home to ESA-listed salmon and bull trout, and performs key ecological functions. The Flood District and other local jurisdictions are responsible for implementing salmon recovery plans for the Green River watershed, complying with the National Clean Water Act, complying with new FEMA development standards, and mitigating impacts that may result from flood control practices. Responsibilities of local jurisdictions to meet these environmental requirements are sometimes in conflict with Corps PL 84-99 eligibility requirements for vegetation management. A SWIF must address the location and appropriate places where habitat values will be improved in concert with public safety values.
- **Current and Future Economic Development:** A great deal is at stake in terms of current jobs and infrastructure, the climate for future economic development, and the capacity of the region to recover from a major flood event. The Green River Valley is the second largest warehouse and product distribution center on the West Coast and as of 2010 represented \$37.36 billion in gross business income. The City of Kent estimates that there are currently 90,000 jobs with \$2.8 billion in annual payroll in the Green River Valley. The key benefit of a SWIF is to develop and implement a program to reduce the risk of severe and sustained economic damage from a catastrophic flood in the Lower Green River Valley.

In addition to the complex issues affecting flood risk in the Green River, ongoing uncertainty about changes in FEMA floodplain mapping practices and plans and federal policy regarding

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certification and accreditation of existing levees is causing concern among property owners and businesses. In an effort to alleviate these concerns some local governments are rapidly engaging in levee improvement programs to meet FEMA flood insurance requirements. While these efforts are meaningful in the short-term, they don't necessarily address the long-term and system wide improvements to the levee system needed to provide an appropriate level of safety protection for the Green River Valley.

Finally, the Puget Sound Partnership is interested in having at least two river basins in Western Washington participate as a SWIF pilot so that we may explore how best to build on our existing work with you and our regional partners. We would like to recommend the Green River levee system as a pilot. We look forward to working with you to help facilitate the development of a regional, multi-objective solution to these complex issues. Mark Isaacson, the Director of the King County Water and Land Resources Division in the Department of Natural Resources and Parks, will be forwarding to you a memorandum that covers the technical aspects of the SWIF by the end of the year. Our hope is that by engaging in a SWIF process we will meet the multiple objectives of improving the structural integrity of the levee system, providing ecological benefits, and reducing maintenance costs over the long term.

Thank you for your continued support on this ground-breaking effort. If you have any questions, need additional information, or if you would like to discuss any of these issues further, please do not hesitate to contact Mark Isaacson at 206-296-6587.

Sincerely,



Dow Constantine  
King County Executive



Julia Patterson  
Chair, King County Flood District

cc: King County Councilmembers  
Mark Carey, Director, Mitigation Division, Federal Emergency Management Agency  
Steve Landino, Director, Washington State Habitat Office, Habitat Conservation  
Division, National Marine Fisheries Service  
Isabel Tinoco, Executive Director, Muckleshoot Fisheries  
Anthony Wright, Executive Director, Puget Sound Partnership  
Jeannie Summerhays, Regional Director, Washington State Department of Ecology  
Kenneth Berg, Manager, Western Washington Field Office, U.S. Fish and Wildlife  
Mark Ohlstrom, Chief, Engineering Division, U.S. Army Corps of Engineers  
The Honorable Peter B. Lewis, Mayor, City of Auburn  
The Honorable Suzette Cooke, Mayor, City of Kent,  
The Honorable Jim Haggerton, Mayor, City of Tukwila  
The Honorable Dennis Law, Mayor, City of Renton

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Kjristine Lund, Executive Director, King County Flood Control District  
Fred Jarrett, Deputy King County Executive, King County Executive's Office (KCEO)  
Carrie S. Cihak, Chief Advisor, Policy and Strategic Initiatives, KCEO  
Christie True, Director, Department of Natural Resources and Parks (DNRP)  
Mark Isaacson, Division Director, Water and Land Resources Division, DNRP



## **Green River System Wide Improvement Framework – Preliminary Draft Scope of Work December 2012**

The purpose of the Lower Green River SWIF is to develop a framework to address key issues on the Green River mainstem (with a focus on the Lower Green), including flood risk reduction facility and engineering deficiencies, levels of protection, capital project solutions, vegetation management, and habitat improvements. The SWIF includes the development of a prioritized list of capital projects as a key element of implementing a Strategic River Management Plan for the Lower Green River. The goal is to reduce risks to public health and safety, reduce public and private property damage from major-river flooding and channel migration, reduce maintenance costs, and improve aquatic and riparian habitat conditions, while protecting and maintaining the local economy. Successful application of the SWIF would help to align regulatory requirements, focus investments in levee improvements to reduce risk, and provide greater certainty about regulatory requirements and flood risk for local governments, as well as businesses making decisions about future investment. It would also enable us to more effectively address salmon recovery needs in both our near- and long-term plans for levee maintenance and reconstruction.

The SWIF will be carried out using the best available technical information, an inclusive stakeholder process, and an analysis of risk and level of service issues. It will also consider the complex economic, social, and cultural conditions in the watershed and the regulatory framework (federal, state, and local requirements).

The following draft scope of work lays out the tasks, sub-tasks, deliverables and schedule to accomplish the work. Note that the schedule will be adjusted based on date of approval for SWIF and initiation of project.

### **Task 1 – Convene a Stakeholder Committee to assist in development of the SWIF**

Task 1.1 – Convene a Stakeholder Committee and develop a process to seek diverse and timely input on the development of the Lower Green River SWIF. The Stakeholder Committee should include representatives from the King County Flood District, cities, tribes, government and resource agencies. A proposal should be developed that specifies the makeup of the committee, the purpose, roles and responsibilities, decision making, topics for discussion, and schedule of meetings.

Task 1.2 – Interview select stakeholders to identify issues and concerns of stakeholders, and how stakeholders desire to participate.

Task 1.3 – Stakeholder Committee Workplan – Determine the number and frequency of meetings needed and develop a work plan for the Stakeholder Committee.

Task 1.4 – Facilitate and Execute Stakeholder Committee Meetings – Employ a professional facilitator and include the facilitator in development of the schedule, agendas, meeting notices, and action items. Assume 12-15 meetings throughout duration of project.

Deliverables:

- (1) Draft list of possible Stakeholder Committee members; Final List of Stakeholder Committee members
- (2) Draft Work Plan for Stakeholder Committee

Schedule: Draft list of stakeholders – January/February 2013; Workplan – April/May 2013; Stakeholder meetings (approximately May 2013-January 2015).

**Task 2 – Define the geographic scope, goals and objectives, vision, and strategy for the Green River SWIF**

This task would be an early priority of the work effort and carried out in close coordination with the stakeholder group.

Task 2.1 – Define geographic scope, including upstream and downstream project extent (e.g., Lower Green River from SR18 to I-405) and the specific levee reaches and facilities to be included; might also include portions or all of Middle Green River mainstem.

Task 2.2 – Agree on goals for Lower Green River corridor and flood management facilities that can be achieved within the next 20 to 50 years.

Example goals (and objectives) include:

- a. Achieve 500-year level of protection (14,900 cfs (or as revised pursuant to Corps studies) at Auburn with sufficient freeboard) for Lower Green River valley communities
- b. Meet modern structural design standards to protect public safety and reduce flood risks (achieve desired factor of safety, e.g., drawdown FOS=1.4)
- c. Set back levees where feasible to increase conveyance and storage capacity, reduce scour/erosion potential, reconnect floodplains, and enhance habitat
- d. Reduce long-term maintenance and operation costs
- e. Enable certification and accreditation of flood management facilities
- f. Phase and sequence capital improvements to maximize benefits and reduce risks through strategic implementation

Task 2.3 – Agree on vision for the Lower Green River. Work with the stakeholder group to evaluate alternative visions and seek agreement through consensus on a common vision for next 50-100 years. In the event that consensus cannot be reached, work with the King County Flood Control Board to set direction on the vision.

Attachment A includes the draft vision from the King County Flood Hazard Management Plan.

Task 2.4 – Agree on flood hazard management strategy for the Lower Green River. Work with the stakeholder group to evaluate alternative strategies and agree on strategy for Lower Green River. Attachment A includes the draft flood hazard management strategy from the King County Flood Hazard Management Plan.

Task 2.5 – Review and agree on project scope with detailed tasks, assumptions, deliverables and schedule. Assumes this preliminary draft scope is the starting point for development of a more detailed scope for review.

Deliverables:

- (1) Geographic scope, reach extents and levee segments (agreed upon by stakeholders group)
- (2) Draft and final goals and objectives (agreed upon by stakeholders group)
- (3) Agreed-upon Vision
- (4) Agreed-upon flood hazard management strategy
- (5) Draft and agreed-upon Scope of Work

Schedule: Geographic scope – May 2013; Goals and objectives, vision and strategy – June/July 2013; Overall Scope of Work – June 2013.

**Task 3 – Complete a vegetation assessment for the levee and revetment facilities historically eligible for the PL84-99 program in the Lower Green River**

Task 3.1 – Map vegetation on flood risk reduction facilities – Perform a vegetation assessment using aerial photo analysis, GIS mapping and ground truthing to characterize the vegetation growing along flood management structures of the Lower Green River.

Task 3.2 – Complete retrospective assessment of vegetation management – Identify historical removal of vegetation for PL84-99 compliance from past records or knowledge of tree removal. Map areas of vegetation removal, dates, and any known information on tree size, canopy cover, and effects on riparian habitat.

Task 3.3 – Document historical knowledge of vegetation impacts on levee integrity or stability – Identify any known historical occurrence on the Lower Green River where windthrow or tree failure caused levee stability problems, or levee erosion was aggravated by the presence of levee vegetation.

Task 3.4 – Complete Vegetation Assessment Report

Deliverables:

- (1) Vegetation Assessment Report, including information about historical vegetation removal, effects on riparian habitat, and known levee integrity issues caused by tree failure or windthrow.

Schedule: Vegetation Assessment Report – December 2013.

## **Task 4 – Analyze Existing Conditions, including Information on Facility Conditions, Infrastructure, and Maintenance**

Task 4.1 – Existing Conditions analysis and report to characterize the geomorphic conditions, hydraulic conditions, salmonid habitat, and levee stability conditions pulling from already produced reports, studies and plans where possible and conducting additional data collection where necessary to get accurate information on system-wide needs.

- a. Identify reach-length segments for compilation of existing data and for new data collection.
- b. Data collection and information management – Collect all existing relevant data, including but not limited to: existing GIS data layers, topographic information and aerial photos, existing basin technical reports, CMZ maps, sediment data and reports, and levee stability data.
- c. Geomorphic Analysis – Review existing data on geologic, geomorphic, and sediment processes, and channel migration. Examine cross-section history and evaluate lateral and vertical channel stability. Analyze effects of channel widening on geomorphic processes.
- d. Hydraulic/Hydrologic Analysis (include assumptions of HHD control) – Use existing HEC-RAS model to analyze additional levee cross-section geometries representing various levels of protection and facility options and location.
- e. Levee Stability and Conditions Analysis, and Facility Deficiencies – Use all existing facility reports, Periodic Inspection Reports, and certification studies. Need to analyze levees outside areas of existing studies and determine potential new data collection needs.
- f. Existing Condition Hazard Assessment by reach segment (include reviewing accuracy of existing data sets) – Assume that existing FLO2D and HAZUS models are the basis of this assessment. Run for new U.S. Army Corps of Engineers (Corps of Engineers) high-flow hydrology (see task 5.1 below).
- g. Aquatic Resources Analysis and Environmental Planning Analysis - conduct an analysis of aquatic and riparian habitat within the geographic study area to support development of floodplain management actions that would provide benefits to salmonids. Integrate data and information collected for tasks 3 and 6.
- h. Synthesize above information and produce Existing Conditions Report(s).

Task 4.2 – Collect new data to fill gaps in information from Task 4.1. This includes geotechnical analysis of existing levees, geomorphic analysis (channel migration and bed scour), and analysis of vegetation (see task 3). Data collection needs will be prioritized by technical staff from the participating stakeholders; it is anticipated that information on subsurface conditions will be one of the most critical needs to better understand the relative stability of different parts of the levee system. Evaluate options and costs, including approaches employing soil borings and remote sensing (see <http://www.water.ca.gov/levees/evaluation/electro.cfm>).

### Deliverables:

- (1) Existing Conditions Report(s) and/or select Technical Memos on discipline topics.

Schedule: Existing Conditions Reports – March 2014.

### **Task 5 – Evaluate Flood Risks and Analyze “Level of Service” Alternatives**

The impacts of major flooding on structures, infrastructure, residents, businesses, jobs and future economic development in the Green River Valley is significant. The Green River Valley is the second largest warehouse and product distribution center on the West Coast and as of 2010 represented over \$37 billion in gross business income. The City of Kent estimates that there are currently 90,000 jobs with \$2.8 billion in annual payroll in the Green River Valley. The key benefit of a SWIF is to develop and implement a program to reduce the risk of severe and sustained economic damage from one or more catastrophic floods in the Lower Green River Valley.

Task 5.1 – Evaluate current flood risks. Recent hydrologic studies by the Corps of Engineers have concluded that the reservoir storage capacity for HHD is sufficient to control only a 140-year flood event. New Corps of Engineers data suggests that 0.2 percent annual chance flows (500-year event) at Auburn may rise to 18,800 cfs (50% probability), or even as high as 26,800 cfs (upper confidence limit, 5% exceedance) (see Table 3 of Assembly of Design Flood Hydrographs for the Green River Basin – Summary Report, Corps of Engineers, September 2012). Lower Green River levees generally contain flood flows up to 12,000 cfs, with varying levels of freeboard. This task would analyze flood risks throughout the Lower Green River and summarize structures and infrastructure at risk and potential damages under different flood flow frequencies.

A risk-based assessment of levee reconstruction and repair needs would be conducted. Many older levee slopes along the Lower Green River are too steep, with minimal scour protection at the base, sloughing banks, continuing toe erosion and significantly degraded habitat. Risk-based prioritization of reconstruction and repair needs would also consider levee vegetation management issues and alternatives.

Use existing information as feasible from King County Flood Risk Assessment, Green River External Advisory Panel Review, Army Corps of Engineers DSES-10 Report, the 180<sup>th</sup>-200<sup>th</sup> Feasibility Study, and other studies.

Task 5.2 Analyze alternative levels of service (e.g., 100-year, 140-year, 200-year, 500-year), including cost/benefit of alternative levels of protection based on structures and infrastructure at risk. Work with Stakeholder Committee to evaluate alternative levels of protection, and recommend desired level of protection for future levee or flood risk reduction facility construction. With the assistance of the Corps of Engineers, use the DSES-10 modeling capacity to evaluate the consequences of different magnitude flood events.

#### Deliverables:

- (1) Report on Evaluation of Flood Risks by levee reach
- (2) Level of Service Technical Memo and Recommendations

Schedule: Evaluation of Flood Risks Report – April 2014; Level of Service Tech Memo – Oct. 2013.

### **Task 6 – Assess Habitat Restoration Opportunities and Develop Vegetation Management Alternatives**

The Green River is important to the Puget Sound ecosystem, is home to ESA-listed salmon and bull trout, and performs key ecological functions. The Flood District and other local jurisdictions are responsible for implementing salmon recovery plans for the Green River watershed, complying with the Clean Water Act, complying with new FEMA development standards, and mitigating impacts that may result from flood control practices. Responsibilities of local jurisdictions to meet these environmental requirements are sometimes in conflict with Corps of Engineers PL 84-99 eligibility requirements for vegetation management. A SWIF should address appropriate methods and places where habitat values will be improved in concert with public safety values and develop system-wide levee improvement alternatives which provide for vegetation management practices compatible with salmon recovery goals.

Task 6.1 – Assess Habitat Restoration Opportunities – Inventory proposed salmon recovery habitat projects in the floodplain, off-channel, and riparian areas in the Lower and Middle Green Rivers that align with flood risk reduction projects or offer mitigation potential. Projects included in the WRIA 9 Salmon Habitat Plan, WRIA 9 three-year work schedule, and other documents as appropriate should be reviewed.

Task 6.2 – Develop and Evaluate Vegetation Management Alternatives – Using the findings and results of task 3, develop and evaluate system-wide levee improvement alternatives for their ability to support long-term riparian habitat restoration and vegetation recovery, including vegetation management alternatives for levees. Develop information and criteria to use in support of developing a regional variance for vegetation management on selected levee alternatives that are compatible with salmon recovery efforts.

#### Deliverables:

- (1) Inventory of Green River Salmon Habitat Projects (mainstem and floodplain)
- (2) Technical Memo on Vegetation Management Alternatives and Regional Variance

Schedule: Habitat Project Inventory – March 2014; Vegetation Management Tech Memo – August 2014.

### **Task 7 – Capital Project Development**

This task involves development of capital projects for the Lower Green River based on information from tasks 2, 4 and 5 above. Use the draft project list from the King County Flood Hazard Management Plan as a starting point for the capital projects. Other sources include proposed city projects and possibly Corps of Engineers ERP projects.

Task 7.1 – Alternatives Analysis Report to develop and evaluate potential floodplain management actions to define capital projects, including but not limited to, levee setbacks, flood walls, property acquisitions, and road and/or bridge alterations or evaluations. The process to develop alternative capital projects should include the following:

- a. Develop reach objectives and project screening criteria
- b. Identify possible project actions and apply criteria
- c. Identify and evaluate alternative scenarios for each reach based on screening criteria to determine preferred alternatives
- d. Conduct preliminary engineering and scientific analysis as necessary to demonstrate that preferred alternatives will function as intended over 20-50 year planning and implementation horizon. Quantify potential benefits, and identify and address potentially adverse cumulative effects
- e. Estimate planning-level costs for each preferred alternative
- f. Synthesize and document above information and produce Alternatives Analysis Report

Task 7.2 – Develop conceptual planning-level designs (10-15%) for capital project facilities identified in the Alternatives Analysis report. For each project, describe the problem, risks, feasibility and preferred option, estimated costs, benefits, and environmental considerations. Once developed to the concept level, actions will be evaluated, prioritized, combined into scenarios, and sequenced based on their flood hazard reduction benefits, feasibility, regulatory compliance, and salmon habitat benefits.

Task 7.3 – Lower Green River Design Guidelines – Examine the potential benefit of developing design guidelines for future levees, including establishing the “design flood”, setback levees, revetments, and flood walls for the Lower Green River. This includes levee design features (top crest, levee slopes, scour depth, etc.). Existing guidance such as Design and Construction of Levees (Corps of Engineers, EM 1110-2-1913), the Urban Levee Design Criteria (California, 2012) and International Levee Handbook (in process) should be consulted. The appropriate use of flood walls should also be evaluated; design considerations for floodwalls and closure structures are still evolving since the 2005 New Orleans flood, and caution should be used when designing and assessing these structures (see April 2011 Corps of Engineers Guidance on Design of I-walls, Circular No. 1110-2-6066). Design guidelines should also include elements related to improving habitat conditions, including incorporation of large wood into designs, benching for vegetation plantings and vegetation management during the life of the structure.

Task 7.4 – Prioritize capital project implementation. Use existing project prioritization criteria as a starting point and refine to meet needs of the Lower Green River with input from the stakeholder group. Existing prioritization criteria include flood risk (e.g., land use consequences, severity of impact, extent of impact, and urgency) and implementation risks (e.g., readiness, leveraging, multiple benefits). Consider possible use of risk-based performance modeling, examining relative benefits of different proposed improvements vs. the cost of improvements.

Deliverables:

- (1) Alternatives Analysis Report

- (2) Capital Projects, including conceptual planning-level designs for 10-12 capital projects
- (3) Draft Design Guidelines for the Lower Green River
- (4) Prioritized capital project list

Schedule: Alternatives Analysis Report – July 2014; Capital Project Conceptual Designs – October 2014; Draft Design Guidelines – September 2014; Prioritized capital project list – December 2014.

**Task 8 – Project Management**

Organize, manage and coordinate the disciplines, King County internal team members, and consultants necessary to accomplish the SWIF. Work closely with the facilitator and Stakeholder Committee throughout the project.



**Green River Vision, excerpted from Draft 2013 King County Flood Hazard Management Plan:**

The long-term vision for floodplain management for the Green River is to develop a river corridor that protects people and property, maintains the structural integrity of the levee system, provides ecological benefits, and reduces maintenance costs over the long term. In the Lower Green River, this vision will primarily be accomplished through a large capital improvement program to replace existing levees with setback levees that meet or exceed Corps of Engineers standards for the Green River system.

**Green River Flood Hazard Management Strategy, excerpted from Draft Flood Plan**  
**Key strategies for the Green River include the following elements:**

- Continue to design and construct new levee structures to design standards that meet or exceed Corps of Engineers standards for the Green River System. This includes providing a 0.2 percent annual chance level of protection. Given the high levels of risk in the Lower Green River valley due to a significant and growing population and increasingly valuable regional infrastructure and commerce, if a 0.2 percent annual chance level of protection is not provided by the Howard Hanson Dam, it must come from the levee system.
- Continue a risk-based approach to identify and prioritize floodplain management through the King County Flood Control District capital improvement project evaluation and prioritization process.
- Continue to maintain existing levees and repair them as needed to protect public safety and property in a way that does not preclude long-term opportunities to eventually set back the levees to a more stable slope geometry.
- Explore opportunities to create a wider flood corridor to provide significantly enhanced flood protection, as well as environmental, recreational and economic benefits as part of a multi-objective river management effort.
- Continue the existing strategy in the Middle-Green River of prioritizing repair and maintenance of flood protection infrastructure using a multi-objective, risk-based approach, with a long-term goal to set back existing flood protection infrastructure and allow unconstrained or less constrained channel migration.
- Existing at-risk structures will be evaluated for acquisition and elevation per the hazard mitigation policies and criteria described in Section 4.2.3 and in coordination with other King County plans and programs.

King County will continue to focus on construction and repair projects proposed in the 2006 Flood Plan, including the rehabilitation and reconstruction of high-priority levee reaches in the Lower Green River. These projects will be constructed as setback levees, with slopes at stable angles to meet Corps of Engineers' levee standards, and use conservative analytical assumptions to target factors of safety for rapid drawdown of 1.4 or greater. Setting back levees to meet or exceed levee design standards may necessitate the purchase and demolition of buildings and relocation of businesses. Setback levees at the correct slope geometry are preferable to

floodwalls along the Green River, since a constructed floodwall would be dependent on an existing aging levee needing continual repair and maintenance, and would be susceptible to a heightened risk of erosion-induced failure where it meets the earth levee. Moreover, setback levees can meet other King County goals, including reduced long-term maintenance costs and improved habitat and floodplain reconnection opportunities.



**City of Tukwila**  
**Department of Public Works**

*Jim Haggerton, Mayor*

*Bob Giberson, P.E., Director*

December 17, 2012

Colonel Bruce Estok  
U.S. Corps of Engineers, Seattle District  
PO Box 3755  
Seattle, WA 98124-3755

Dear Colonel Estok:

I am writing to express the City of Tukwila's support for the proposed System Wide Improvement Framework (SWIF) for the Green River Levee System, as described in separate correspondence from the King County Water and Land Resources Division.

As you know, the City of Tukwila is the local sponsor of the Tukwila 205 levee, as established in the Project Cooperation Agreement. The city's maintenance responsibilities per the PCA are shared with the King County Flood Control District per an interlocal agreement.

Tukwila supports the proposed Green River SWIF, which includes the Tukwila 205 levee. Tukwila will participate in the SWIF as the sponsor of that important federal levee.

The proposed SWIF effort will bring together federal partners, the King County Flood District, state and local governments, the Muckleshoot Indian Tribe, and the business community in taking an integrated approach to risk-based assessment to evaluate levee reconstruction, repair and other appropriate flood safety strategies. We believe this opportunity will help bring resolution to the continuing levee vegetation conflicts. We greatly appreciate your agency's assistance in helping cooperatively solve the public safety, economic sustainability and environmental challenges we face in our county.

Thank you for your continued support on this ground-breaking effort. If you have any questions, please contact Ryan Larson at (206) 431-2456.

Sincerely,

Bob Giberson, P.E.  
Director, Public Works

cc: Mark Isaacson, Division Director, Water and Land Resources Division (WLRD), DNRP  
Steve Bleifuhs, Manager, River and Floodplain Management Section, DNRP, WLRD

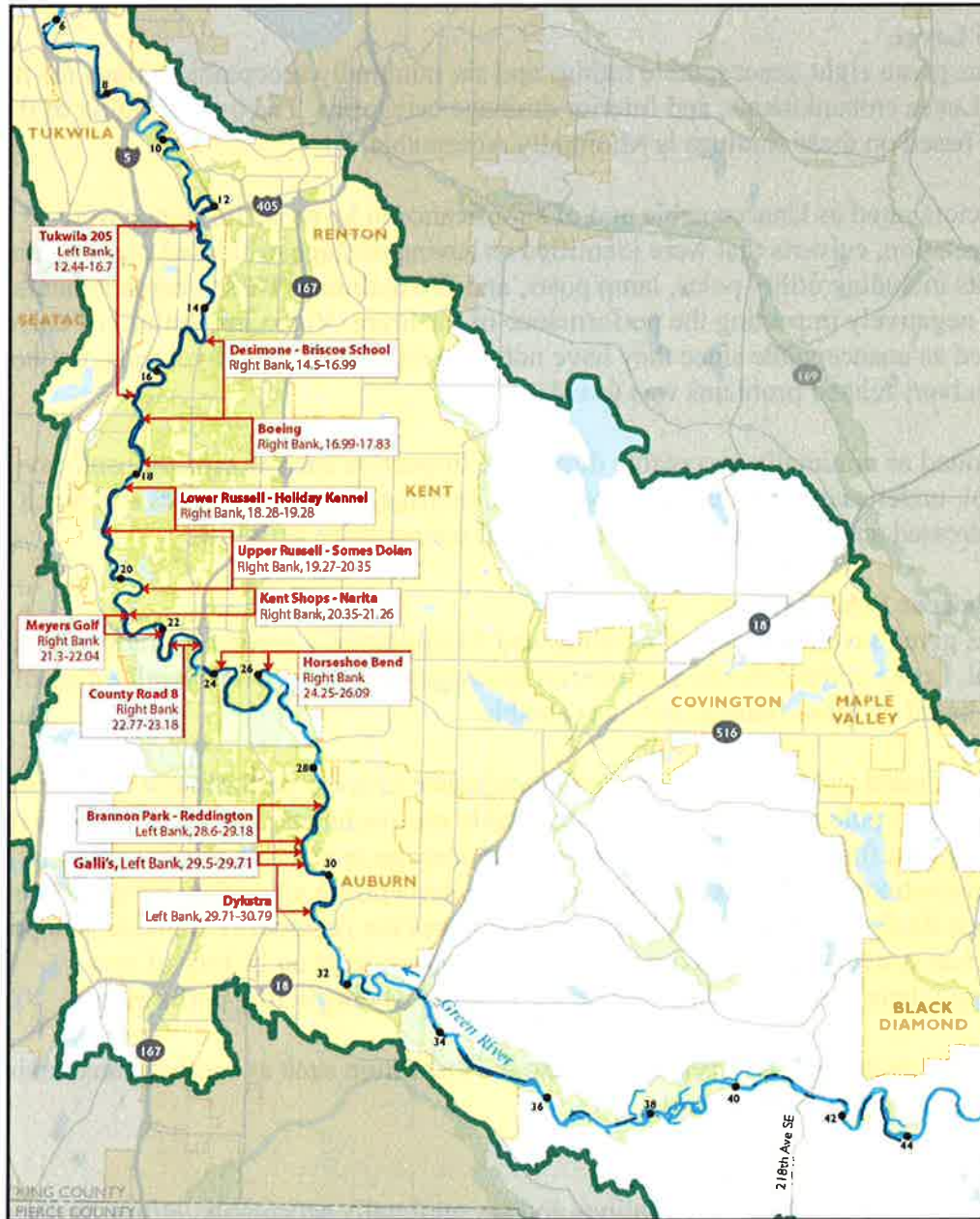
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**6300 Southcenter Boulevard, Suite #100 • Tukwila, Washington 98188 • Phone: 206-433-0179 • Fax: 206-431-3665**









### Middle Green River Flood Protection Facilities

<b>Facility/Segment Name</b>	<b>D/S RM</b>	<b>U/S RM</b>	<b>Bank</b>	<b>Length (feet)</b>
33.8	33.3	33.3	R	139
Soos Creek D/S	33.3	33.4	L	229
Soos Creek U/S	33.4	33.4	L	105
Lake Holm Rd	33.4	33.5	R	281
Porter	33.8	34.1	L	1349
Neely	34.4	34.8	L	1905
Koech	34.5	34.8	R	1549
Pre-1959	34.8	35.0	L	1213
Horath	34.9	35.2	R	1913
Hamakami	35.3	35.6	R	1380
Turley	36.6	36.9	R	1631
Loans	37.4	37.6	R	1520
Marguerite Hansell	40.3	40.3	R	259
Meyer Dike	40.5	40.7	R	942
Imhof	40.7	40.9	R	917
41.8	41.1	41.2	L	287
41.9	41.2	41.3	L	399
Green Valley Road Protection	41.6	41.8	R	770
D/S Flaming Geyser Bridge	42.4	42.5	L	486
U/S Flaming Geyser Bridge	42.5	42.7	L	555
Old Flaming Geyser Bridge	42.7	42.8	L	781
Flaming Geyser Road	43.2	43.9	L	4181
Park D/S	44.0	44.0	L	92
Park U/S	44.0	44.0	L	122

**\* The Middle Green River Levees on this list aren't included in the PL 84-99 program, but may be included in a comprehensive SWIF.**



## GREEN RIVER LEVEES

-  Extent of Levee Segment Identified in Periodic Inspection Report
-  Rivers and Streams with FEMA Mapped 100-Year Regulatory Floodplains
-  Rivers and Streams with Unmapped Regulatory Floodplains
-  Flood Protection Infrastructure (Levees & Revetments)
-  River Miles (Approximate)
-  Watershed/Basin Boundary
-  Road
-  Incorporated Area

The information included on this map has been derived from a variety of sources which are subject to change without notice. King County makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of any information. King County shall not be liable for any general, special, indirect, incidental, or consequential damages including, but not limited to, lost earnings or lost profits resulting from the use or misuse of the information contained on this map. Any sale of this map or information on this map is prohibited except by written permission of King County.

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File name: 1212\_3008greenLEVEEmap.ai mgsb



  
King County  
Department of  
Natural Resources and Parks  
Water and Land Resources Division

## **Lower Green River Periodic Inspections Rating Summary**

*Summarized from the April 2011 Final Report*

### **Tukwila 205 Levee**

This levee was given eight unacceptable ratings and six minimally acceptable ratings for items in the General, Levee embankments, and Interior drainage categories. The overall rating of this levee system based on these findings is Minimally Acceptable.

The major factors rated as Unacceptable and of significance to levee performance were unwanted vegetation, culverts that were identified as having damage or limited capacity and encroachments including utility poles, lamp posts, and fire hydrants. These encroachments have no history of negatively impacting the performance of the levee. Video inspections of culverts were also rated as unacceptable since they have not been done in the past five years, but no evidence of culvert-related problems was found.

Other issues rated as minimally acceptable during the inspection such as erosion/bank caving, animal control, under seepage relief wells/toe drains, seepage, flap gates, valves and pinch valves should be addressed and given priority during normal maintenance activities.

### **Desimone -Briscoe School Levee**

The levee was given seven unacceptable ratings and five minimally acceptable ratings for items in the General, Levee embankments, and Interior drainage categories. The overall rating of this levee system based on these findings is Unacceptable.

The major factor rated as Unacceptable and of significance to levee performance was unwanted vegetation. A power pole was listed as an unacceptable encroachment, but there has been no evidence during past flood events that would indicate seepage or stability issues caused by this pole. Video inspections of culverts were also rated as unacceptable since they have not been done in the past five years, however, lack of the video does not necessarily translate to a poorly performing levee system and the culverts in this levee system have no history of non-performance and there is no indication that they are negatively impacting performance.

Other issues rated as minimally acceptable during the inspection such as erosion/bank caving, depressions/rutting, and animal control.

### **Boeing Levee**

The levee was given five unacceptable ratings and six minimally acceptable ratings for items in the General and Levee embankments categories. The overall rating of this levee system based on these findings is Unacceptable.

The major factors rated as Unacceptable and of significance to levee performance were encroachments, animal burrows and unwanted vegetation. Dense vegetation with trees exceeding the Seattle District variance on the riverward slope and on the landward slope is rated unacceptable.

Other issues rated as minimally acceptable during the inspection such as erosion/bank caving, depressions and rutting, and cracking should be addressed and given priority during your normal maintenance activities.

### **Lower Russell Road Levee**

The levee was given seven unacceptable ratings and six minimally acceptable ratings for items in the General and Levee embankments categories. The overall rating of this levee system based on these findings is Unacceptable.

The major factors rated as Unacceptable and of significance to levee performance were encroachments and unwanted vegetation. Dense vegetation with trees exceeding the Seattle District variance on the riverward slope and on the landward slope is rated unacceptable. Encroachments in the levee prism include: wooden and chain link fences, water and sewer pipes, utility vaults, manholes, power poles, hydrants, and buildings. Culverts also were listed as an unacceptable item since they have not been inspected visually or with video in the last five years.

Other issues rated as minimally acceptable during the inspection such as erosion/bank caving, slope stability, cracking and animal control. Slope stability issues were noted in one area.

### **Upper Russell Road Levee**

The levee was given six unacceptable ratings and six minimally acceptable ratings for items in the General and Levee embankments categories. The overall rating of this levee system based on these findings is Unacceptable.

The major factor rated as Unacceptable and of significance to levee performance was unwanted vegetation. Encroachments in the levee prism include: manholes, power poles, hydrants, and a small one room structure. Culverts also were listed as an unacceptable item since they have not been inspected visually or with video in the last five years.

Other issues rated as minimally acceptable during the inspection such as erosion/bank caving, depressions/rutting, cracking and animal control. Slope stability issues were noted in two locations and longitudinal cracking was noted along the length of the levee.

### **Kent Shops Levee**

The levee was given three unacceptable ratings and three minimally acceptable ratings for items in the General and Levee embankments categories. The overall rating of this levee system based on these findings is Minimally Acceptable.

The major factor rated as Unacceptable and of significance to levee performance was unwanted vegetation. Although most of the levee was recently re-built by the Corps and is rated acceptable for vegetation, there are areas where vegetation is dense and beyond allowable criteria identified in the Seattle vegetation variance. Power poles were listed as an unacceptable encroachment at several locations, but there has been no evidence during past flood events that would indicate seepage or stability issues were caused by these poles.

Other issues rated as minimally acceptable during the inspection such as slope stability, and rutting. Shallow sloughing was observed in two areas.

### **Meyers Golf Levee**

The levee was given four unacceptable ratings and five minimally acceptable ratings for items in the General and Levee embankments categories. The overall rating of this levee system based on these findings is Minimally Acceptable.

The major factor rated as Unacceptable and of significance to levee performance was unwanted vegetation. Power poles were listed as an unacceptable encroachment at four locations, but there has been no evidence during past flood events that would indicate seepage or stability issues were caused by these poles.

Other issues rated as minimally acceptable during the inspection such as erosion/bank caving, depressions/rutting, and animal control. Two other areas of depression/rutting were noted and should be addressed as well during normal maintenance activities.

### **County Road 8 Levee**

The levee was given six unacceptable ratings and five minimally acceptable ratings for items in the General, Levee embankments and Interior drainage categories. The overall rating of this levee system based on these findings is Unacceptable.

The major factor rated as Unacceptable and of significance to levee performance was unwanted vegetation. Two power poles were listed as unacceptable encroachments, but there has been no evidence during past flood events that would indicate seepage or stability issues. Video inspections of culverts were also rated as unacceptable since they have not been done in the past five years, however, lack of the video does not necessarily translate to a poorly performing levee system and the culverts in this levee system have no history of non-performance and there is no indication that they are negatively impacting performance.

Other issues rated as minimally acceptable during the inspection such as erosion/bank having, depressions/rutting, and animal control.

### **Horseshoe Bend Levee**

The levee was given four unacceptable ratings and seven minimally acceptable ratings for items in the General and Levee embankments categories. The overall rating of this levee system based on these findings is Minimally Acceptable.

The major factor rated as Unacceptable and of significance to levee performance was unwanted vegetation. Dense vegetation with trees exceeding the Seattle District variance on the riverward slope and on the landward slope were rated unacceptable and occupy most of the length of the levee. A power pole was listed as an unacceptable encroachment, but there has been no evidence during past flood events that would indicate seepage or stability issues were caused by this pole. Video inspections of six culverts were also rated as unacceptable since they have not been done in the past five years and were not identified on the as-builts. However, lack of the video does not necessarily translate to a poorly performing levee system. The culverts in this levee system have no history of non-performance and there is no indication that they are negatively impacting performance. Missing flap gates were also observed.

Other issues rated as minimally acceptable during the inspection such as erosion/bank caving, slope stability, depressions and rutting, cracking and animal control.

### **Brannon Park -Reddington Levee**

The levee was given seven unacceptable ratings and five minimally acceptable ratings for items in the General, Levee embankments, and Interior drainage categories. The overall rating of this levee system based on these findings is Unacceptable.



The major factor rated as Unacceptable was unwanted vegetation. Video inspections of culverts were also rated as unacceptable since they have not been done in the past five years, however, lack of the video does not necessarily translate to a poorly performing levee system and the culverts in this levee system have no history of non-performance and there is no indication that they are negatively impacting performance.

Other issues rated as minimally acceptable during the inspection such as minor erosion/bank caving, depressions/rutting, and animal control.

### **Galli's Levee**

The levee was given four unacceptable ratings and four minimally acceptable ratings for items in the General and Levee embankments categories. The overall rating of this levee system based on these findings is Minimally Acceptable.

The major factor rated as Unacceptable and of significance to levee performance was unwanted vegetation. Although most of the levee was recently re-built by the Corps and is rated acceptable for vegetation, there is a small section where vegetation is thick and beyond allowable criteria identified in the Seattle vegetation variance. Culverts also were listed as an unacceptable item since one has not been inspected visually or with video in the last five years. The culvert in this levee system has no history of non-performance and there is no indication that it is negatively impacting performance.

Other issues rated as minimally acceptable during the inspection such as depressions and rutting and seepage.

### **Dykstra Levee**

The levee was given five unacceptable ratings and six minimally acceptable ratings for items in the General and Levee embankments categories. The overall rating of this levee system based on these findings is Minimally Acceptable.

The major factors rated as Unacceptable and of significance to levee performance were encroachments and unwanted vegetation. Dense vegetation with trees exceeding the Seattle District variance on the riverward slope and on the landward slope is rated unacceptable. Encroachments in the levee prism include: chain link fences, deck, and retaining wall. Culverts also were listed as an unacceptable item since they have not been inspected visually or with video in the last five years. The culverts in this levee system have no history of non-performance and there is no indication that they are negatively impacting performance.

Other issues rated as minimally acceptable during the inspection such as erosion/bank caving, slope stability, and depressions and rutting.