

**SEATTLE PUBLIC UTILITIES**  
**SEPA ENVIRONMENTAL CHECKLIST**

This SEPA environmental review of Seattle Public Utilities' RainWise Program has been conducted in accord with the Washington State Environmental Policy Act (SEPA) (RCW 43.21C), State SEPA regulations [Washington Administrative Code (WAC) Chapter 197-11], and the City of Seattle SEPA ordinance [Seattle Municipal Code (SMC) Chapter 25.05].

**A. BACKGROUND**

**A1. Name of proposed project:**

Residential RainWise Program

**A2. Name of applicant:**

Seattle Public Utilities

**A3. Address and phone number of applicant and contact person:**

Bob Spencer, Program Manager  
Seattle Public Utilities  
700 Fifth Ave, Suite 4900  
PO Box 34018  
Seattle, WA 98124-4018  
206-684-4163

**A4. Date checklist prepared:**

February 5, 2013

**A5. Agency requesting checklist:**

Seattle Public Utilities (SPU)

**A6. Proposed timing or schedule (including phasing, if applicable):**

SPU's Residential RainWise Program (Program) provides technical support, education/outreach, and other resources to assist the general public, homeowners, landscapers, and property managers in understanding low impact development techniques such as site design, pervious paving, vegetation retention, sustainable landscape practices, and other natural drainage solutions (NDS). The Program also provides rebates to private landowners (at their request and if eligible) for the installation of rain gardens and cisterns to reduce stormwater runoff from their private properties. Property owners are responsible for obtaining any required permits. To be eligible for a rebate, all construction must be performed by a contractor licensed to do business in the State of Washington and all RainWise design requirements must be met and verified by an SPU inspector.

This SEPA Environmental Checklist reviews Program activity beginning in March 2012 and lasting through December 2017. Approximately 116 installations were completed in 2012, and approximately 500 to 550 installations are expected to be completed each year thereafter. The Program has a goal of 3,005 installations total. The rebate program is

currently limited to private properties in the Ballard, Delridge, North Union Bay, and Windermere areas (see Attachment A). Future potential rebate areas include Duwamish, Fremont/ Wallingford, Genesee, Henderson, Leschi, Madison Park, Montlake, and Portage Bay. Specific private property locations are identified as contractors either apply for a pre-construction inspection or, for contractors that have satisfactorily constructed a number of RainWise installations, submit a Notice of RainWise Project form. In addition, SPU may also install up to 12 demonstration rain gardens and cisterns on publicly owned parcels.

**A7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.**

As noted above, SPU plans to extend the RainWise Program into other CSO basins during the 2013-2017 time period. SPU currently has no plans for other future additions or expansions related to the proposed Program. King County will be offering the RainWise Program in combined sewer overflow (CSO) basins under their jurisdiction within the City of Seattle (see Section A12).

**A8. List any environmental information you know about that has been prepared, or would be prepared, directly related to this proposal.**

Kindred, J. Scott and David McCormack (Aspect Consulting, LLC). 2012. RainWise Program Groundwater Impacts Assessment, Seattle, Washington. Report prepared for SPU, April 6.

King County. 2012. SEPA Environmental Checklist for the King County Wastewater Treatment Division Long-term Combined Sewer Overflow Control Plan. June 26.

Lancaster, Alice. 2009. October 6 Memorandum: Average Annual Runoff Volume from Impervious Surface in the City of Seattle. Herrera Environmental Consultants, Seattle, WA.

SPU. 2010. SEPA Environmental Checklist and Associated Determination of Non-significance for 2010 CSO Reduction Plan Amendment. April.

Troost, K.G., D.B. Booth, A.P. Wisher, and S.A. Shimmel. 2005. Geologic Map of Seattle. U.S. Geological Survey Open File Report 2005-1252.

**A9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.**

SPU is not aware of pending government approvals of other proposals that directly affect this Program or properties potentially affected by this Program.

**A10. List any government approvals or permits that would be needed for your proposal, if known.**

Private property owners are responsible for complying with any applicable federal, state, and local regulations and for obtaining any required permits for work on their property. SPU would be responsible for complying with regulations and obtaining any required permits for demonstration rain gardens and cisterns installed on publicly owned parcels. Generally, however, RainWise installations do not require permits because they are of such character as to avoid triggering permits (such as grading permits), land use reviews, and so forth. There are no additional government approvals or permits required to implement the RainWise Program.

**A11. Give a brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)**

The City of Seattle (City) is required to reduce the number of untreated overflows from its combined sewer system to meet state and federal regulations. In a combined sewer system, wastewater (from homes and businesses) and stormwater (from rooftops and streets) flow into a single pipeline. During heavy rains, wastewater and stormwater volumes can exceed the system's capacity, causing a combined sewer overflow (CSO) into the nearest receiving water such as Lake Washington or Puget Sound. CSOs are a public health and environmental concern because they carry pollutants—primarily untreated sewage and stormwater runoff—into the receiving water bodies.

High-level screening of CSO control alternatives conducted through SPU's 2010 CSO Reduction Plan Amendment (SPU 2010) concluded that retrofitting existing pavement, stormwater infrastructure, and pervious surfaces with NDS could control a significant portion of the CSO volume in certain areas. Subsequent preliminary engineering conducted by SPU confirmed the beneficial use of NDS on a large-scale to help with CSO control in these areas. One of the NDS tools identified as potentially useful in this regard is the RainWise Program.

The Program assists the general public, homeowners, landscapers, and property managers in understanding low impact development techniques, including site design, pervious paving, vegetation retention, sustainable landscape practices, and other NDS practices. The Program is intended to benefit both SPU rate-payers (in terms of managed future rates for stormwater management) and the environment (in terms of reduced CSOs and improved water quality). The primary objective of the Program in CSO areas is to reduce CSOs through cost-effective implementation of NDS techniques on private parcels, at schools, and at community sites. The Program has the following secondary objectives:

- Promote the concept that stormwater management is every citizen's responsibility;
- Promote awareness among SPU customers regarding the CSO problem in their neighborhoods;
- Actively involve SPU customers in reducing CSOs;
- Promote a sustainable technology consistent with the City's Climate Action Now objectives;
- Reduce demand on conveyance piping infrastructure and (in partially separated portions of CSO areas) improve water quality.

This Program provides technical support, education/outreach, and other resources on how to slow, spread, filter, and infiltrate stormwater. Such resources include raingarden and cistern design information, plant lists, and maintenance guidelines (available at [www.seattle.gov/util/rainwise](http://www.seattle.gov/util/rainwise)). Also, RainWise Tools ([www.rainwise.seattle.gov](http://www.rainwise.seattle.gov)) is an Internet-based education, recruitment, tracking, and marketplace outreach tool that informs property owners of Program eligibility and helps educate property owners about NDS techniques they can use on their properties.

In targeted CSO basins, the Program also connects private property owners with trained contractors who can install raingarden and cistern facilities eligible for RainWise rebates. Raingardens and cisterns reduce peak CSO flows by providing storage and infiltration of roof runoff. The value of the rebate is based on the amount of impervious rooftop disconnected from the City's piped stormwater system and directed to the constructed RainWise installation. The Program has a goal of 3,005 installations total through December 2017. Approximately 105 installations were completed in 2012, and approximately 500 to 550 installations are expected each year thereafter. Currently, stand-alone above-ground cisterns comprise approximately 10 percent of these installations, with the remainder being either a combination raingarden and cistern or a raingarden only.

Whether on public property or private property, installations would be typically performed by private contractors, each of whom uses different methods and means. Generally, most installations require 1 to 2 laborers; larger companies or projects may use more laborers. Construction duration varies from 24 to 60 hours depending on extent and complexity of the individual project. Most raingarden excavations are typically done by hand using shovels and wheelbarrows, but some contractors use small excavators such as a Bobcat. Other motorized machinery may include sod-cutters, rototillers, and air spades.

- A12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.**

The planning area for deployment of SPU's RainWise Rebate Program includes 13 targeted areas (neighborhoods) within SPU's jurisdiction—all within the municipal limits of the City of Seattle, King County, Washington ("Seattle Rainwise Basins" on Attachment A). These targeted areas include about 9.3 square miles of land with approximately 28,000 eligible parcels. All raingarden and cisterns would be installed by trained contractors on privately owned parcels within some or all of these targeted areas. SPU would also install an estimated up to 12 demonstration rain gardens and cisterns on publicly owned parcels in the same targeted areas as the rebate program. The Program is currently limited to properties in the Ballard, Delridge, North Union Bay, and Windermere areas. Future potential areas include Duwamish, Fremont/ Wallingford, Genesee, Henderson, Leschi, Madison Park, Montlake, and Portage Bay. Specific locations are identified as contractors either apply for a pre-construction inspection or, for contractors that have satisfactorily constructed a number of RainWise installations, submit a Notice of RainWise Project form.

## **B. ENVIRONMENTAL ELEMENTS**

By offering rebates, the RainWise Program incentivizes the installation of raingardens and cisterns to reduce stormwater runoff from private properties. It is not possible to identify the specific individual projects or affected parcels at this time, so the Checklist instead analyzes and discloses potential environmental impacts that could result from installation of raingardens and cisterns in the aggregate.

**B1. Earth**

**a. General description of the site:** *[Check the applicable boxes]*

- Flat       Rolling       Hilly       Steep Slopes       Mountainous  
 Other:

In general, the planning area is characterized by a wide variety of topographical features, ranging from stream valleys, ravines, and hillsides adjacent to Lake Washington, shallow estuaries, and deep marine waters. The City of Seattle is located on a series of hills and intervening valleys in the Puget Sound lowlands.

**b. What is the steepest slope on the site (approximate percent slope)?**

Slopes in the planning area generally range from 0 to 40 percent, with steeper slopes present.

**c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.**

As the result of several periods of glaciation, various types of glacial tills underlie much of the planning area (Troost et al. 2005). Some of those tills are compacted or cemented. Permeable soils overlying the till are shallow, ranging from 2 to 4 feet deep, while impermeable till layers may be quite deep. Compact clay (hardpan) often underlies surface soils. Predominant soil types in the area are artificial fill, alluvial soils, and the Alderwood soils series. Alderwood soils occur in upland areas and are the most common soils in King County. Alluvial soils occur in stream and river valleys. Due to previous urban and suburban development, prime farmland is no longer present within Seattle.

Because most of the planning area is densely urbanized, native soils have been extensively altered by excavation, filling, and other disturbance. In addition, soils on the parcels this Program would affect are likely to include highly disturbed native soils and fill materials as a result of the construction, operation, and maintenance of structures and paved surfaces.

**d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe:**

Unstable soils in the planning area primarily occur in areas of steep slopes and in areas of artificial fill or alluvial soils with shallow water tables that may lead to soil liquefaction during earthquakes. Areas where these conditions may exist have been mapped by the City of Seattle Department of Planning and Development (DPD) as environmentally critical areas such as Liquefaction Areas, Steep Slope Areas (greater than 40 percent slopes), Known Slide Areas, and Potential Slide Areas. Sensitive slope areas are often located where relatively permeable geologic units overlie impermeable units. The most extensive landslide-sensitive geologic contact occurs where the Esperance Sand (Vashon advance glacial outwash) overlies the Lawton Clay (Vashon advance glaciolacustrine deposit). In this setting, ground water within the Esperance Sand can saturate the lower portion of the Esperance Sand and colluvium and older landslide debris resting on the Lawton Clay and increase the

likelihood of deep-seated landslides. Because of the thickness and regional extent of these units, landslides associated with the contact between the Esperance Sand and the Lawton Clay (or other low permeability units) tend to be larger and more destructive than average landslides in the City.

Kindred and McCormack (2012) have mapped “proximity to slide hazard areas” for most (but not all) of SPU’s RainWise areas. They modeled the anticipated infiltration volumes from this Program and the potential of such infiltration increasing deep-seated landslides in those areas. They determined the Program would not significantly impact potential for deep-seated landslides and that the Program’s required 300 foot setback (described below) from landslide hazard areas would provide an appropriate measure of protection for landslide-prone areas. The potentials for impacting deep-seated landslides in RainWise areas not analyzed by Kindred and McCormack are not known, but are presumed to be similar to the areas that were analyzed. SPU is currently planning to conduct a similar analysis for those areas not examined by Kindred and McCormack. Those results would be used to modify the number, density, or other characteristics of RainWise projects in those areas, as appropriate.

**e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate the source of fill.**

Filling and/or grading activity would occur as part of the construction of raingardens and cisterns. The range of raingarden sizes is approximately 30 to 204 square feet (including 2.5/1 side slopes). The depth of the raingardens is 18 inches for the bottom area of the raingarden, but RainWise raingardens are required to replace 12 inches of that depth with bioretention soil. The resulting approximate depth of the raingarden ranges from 6 to 10 inches, and soil from the excavation may comprise 4 or more inches of berm that contribute to that height. This range of raingarden sizes would thus require between 45 and 306 cubic feet of excavation per raingarden and between 30 and 204 cubic feet of fill (bioretention soil) per raingarden. For purposes of estimation, if all 3,005 installations were raingardens of the largest size, then the resulting total excavation for this Program would collectively disturb 14.1 acres of land, excavate 34,057 cubic yards of earth, and fill with 22,704 cubic yards of bioretention soil. Those impacts would be distributed over a large planning area on relatively small and predominantly residential parcels over a period of several years.

**f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe:**

No significant erosion is anticipated during or as a result of installation of raingardens or cistern because those installations disturb small areas of ground and disturbed soils are mulched and planted soon after excavation and grading are complete.

**g. About what percent of the site would be covered with impervious surfaces after project construction (for example, asphalt or buildings)?**

Installation of raingardens and cisterns do not involve construction of impervious surfaces. The Program is intended to disconnect pervious surfaces from the City’s piped stormwater system, resulting in improved habitat and water quality conditions in the City’s receiving waters.

**h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:**

All projects must comply with the applicable grading provisions of the City's Stormwater Code (SMC 22.800-22.808), and applicable Director's Rules. Installations that infiltrate stormwater may not be used within 300 feet of mapped steep slopes or near known landslide areas. To ensure stability of rockeries and walls, raingardens are required to be setback some distance from those features (the distance depending on the height of any specific rockery or wall). Those installations disturb small areas of ground on any one parcel and the disturbed soils are mulched and planted soon after the excavation and grading are complete. Impacts would be distributed over a large planning area on relatively small and predominantly residential parcels over a period of several years.

**B2. Air**

**a. What types of emissions to the air would result from the proposal [e.g., dust, automobile, odors, industrial wood smoke, greenhouse gases (GHG)] during construction and when the project is completed? If any, generally describe and give approximate quantities if known.**

Mobile and stationary equipment would be used to construct raingarden and cistern installations, thus generating emissions due to the combustion of gasoline and diesel fuels (such as oxides of nitrogen, carbon monoxide, particulate matter and smoke, uncombusted hydrocarbons, hydrogen sulfide, carbon dioxide, and water vapor). Emissions during construction would also include normal amounts of dust from sod-cutting, grading, and rototilling activities and exhaust from vehicles and construction equipment. These emissions are expected to be minimal, localized, and temporary.

This Program would generate greenhouse gas (GHG) emissions in two ways: pipe/cistern usage (embodied) and construction activity. The embodied GHG emissions of pipes and cisterns are unknown. Operation and maintenance of installed raingardens and cisterns are not expected to generate GHG. Total GHG emissions for the Program are broadly estimated to be 653 metric tons of carbon dioxide emission (MTCO<sub>2e</sub>) for all 3,005 installations (assuming they are all raingardens). The GHG emission calculations are shown in Attachment B. One metric ton is equal to 2,205 pounds.

This Program would generate GHG emissions during the estimated maximum 5 working-day construction duration through the operation of diesel- and gasoline-powered equipment and to transport materials, equipment, and workers to and from each of the 3,005 project sites. Because project construction methods were not completely known at the time this checklist was prepared, the estimates provided here are based on daily vehicle operation times for the estimated project duration (maximum 5 working days per installation); site-specific times may be less or more. Construction activities would generate an estimated 653 MTCO<sub>2e</sub> for all 3,005 installations (assuming they are all raingardens and assuming all take 5 working days to construct).

**b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.**

There are no known off-site sources of emissions that may affect this proposal.

**c. Proposed measures to reduce or control emissions or other impacts to air, if any:**

During construction, impacts to air quality would be reduced and controlled through implementation of standard federal, state, and local vehicle emission control criteria.

**B3. Water**

**a. Surface:**

- (1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If so, describe type and provide names. If appropriate, state what stream or river or water body it flows into.**

In general, the planning area is characterized by a wide variety of surface water features, including marine areas, rivers, lakes, artificial reservoirs, streams, and wetlands. Potential projects could occur in the vicinity of the Puget Sound, Lake Washington, the Green/Duwamish River, Green Lake, and various urban streams and wetlands (Water Resource Inventory Areas 8 and 9).

- (2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If so, please describe, and attach available plans.**

Some raingardens or cistern installations may require work within 200 feet of such waters, but no work would be conducted in those waters. Because raingardens require soils with high permeability, raingardens are not installed in wetland or stream areas.

- (3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands, and indicate the area of the site that would be affected. Indicate the source of fill material.**

No raingardens or cistern installations would require filling or dredging of surface waters or wetlands.

- (4) Will the proposal require surface water withdrawals or diversions? If so, give general description, purpose, and approximate quantities if known.**

The Program would not require surface water withdrawals or diversions. Raingarden and cistern installations would intercept and infiltrate stormwater that might otherwise be directed to the City's piped combined sewage collection system. Assuming 3,005 such installations and an average 1,000 square feet of roof area directed to each installation, SPU roughly estimates that 147.3 acre-feet (47 million gallons) of stormwater would be annually intercepted from rooftops and infiltrated into the ground (Lancaster 2009).

- (5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.**

Some raingardens or cistern installations may occur within a 100-year floodplain. However, because raingardens require soils with high permeability, raingardens are not installed in wetland or stream areas.

- (6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.**

No raingardens or cistern installations would produce or discharge waste materials to surface waters.

**b. Ground:**

- (1) Will ground water be withdrawn, or would water be discharged to ground water? If so, give general description, purpose, and approximate quantities if known.**

No ground water would be withdrawn as a result of this Program. Raingarden and cistern installations would intercept and eventually infiltrate stormwater that might otherwise be directed to the City's piped combined sewage collection system. Assuming 3,005 such installations and an average 1,000 square feet of roof area directed to each installation, SPU roughly estimates that 147.3 acre-feet (47 million gallons) of stormwater would be annually intercepted from rooftops and infiltrated into the ground (Lancaster 2009). The Program is intended to disconnect pervious surfaces from the City's piped stormwater system, resulting in improved habitat and water quality conditions in the City's receiving waters.

- (2) Describe waste material that would be discharged into the ground from septic tanks or other sources, if any (e.g., domestic sewage; industrial, containing the following chemicals...; agricultural, etc.). Describe the general size of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.**

This Program would not discharge waste material to ground water.

**c. Water Runoff (including storm water):**

- (1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where would this water flow? Would this water flow into other waters? If so, describe.**

Assuming 3,005 installations and stormwater runoff from an average 1,000 square feet of roof area directed to each installation, SPU roughly estimates that 147.3 acre-feet (47 million gallons) of stormwater would be annually intercepted from rooftops and infiltrated into the ground (Lancaster 2009). Stormwater flows from adjacent roadways, driveways, and other impervious surfaces near some project locations may also be directed to raingardens and infiltrated. The Program is intended to disconnect pervious surfaces from the City's piped combined sewage collection system, resulting in improved habitat and water quality conditions in the City's receiving waters. The raingardens and cisterns would not generate runoff. Stormwater runoff may need to be managed during construction to prevent sediment from entering and leaving project sites.

- (2) Could waste materials enter ground or surface waters? If so, generally describe.**

Because installed raingardens and cisterns would direct stormwater to the ground through infiltration, materials commonly found on rooftops could be discharged to ground water. Such materials typically include metals (including copper, zinc, and lead, for example) and microbes (including pathogens such as *Giardia*, *Cryptosporidium*, *Campylobacter*, *Vibrio*, *Salmonella*, *Escherichia*, and

*Pseudomonas*). Primary sources of contamination are pollution from the air, animal feces, and insects. Generally, these contaminants are present at low levels and are not considered problematic in non-potable, non-domestic rooftop catchment applications such as raingardens and the cisterns installed by the RainWise Program. Metals are known to generally be chelated in soils and tend to be immobile.

**d. Proposed measures to reduce or control surface, ground, and runoff water impacts, if any:**

No adverse impacts to surface or runoff water are anticipated. The Program is intended to disconnect pervious surfaces from the City's piped stormwater system, resulting in improved habitat and water quality conditions in the City's receiving waters.

Potential impacts to ground water can be evaluated on several levels, including near-field impacts (typically within 50 feet of a raingarden), neighborhood-wide impacts (due to the cumulative effect of multiple raingardens in a neighborhood), and basin-wide impacts (due to the total increase of infiltration within a basin). Using the Program's anticipated infiltration volumes, Kindred and McCormack (2012) modeled the potential impacts at each of these levels for most (but not all) of SPU's RainWise areas. Based on their simulations, they determined that near-field impacts would not be significant. Modeling suggested that areas currently exhibiting basement seepage or surface discharge could see a slight increase in flow, but that it would be unlikely this increase would be distinguishable from normal variability. Their water balance analyses indicated that widespread installation of raingardens (averaging 1 raingarden per 20,000 square feet) could result in a 7 to 12 percent increase in ground water recharge that could result in a small rise in perched ground water levels at neighborhood-wide and basin-wide levels. They determined this relatively small rise in ground water levels would not cause significant impacts in areas that had not reported issues associated with shallow ground water in the past.

The potentials for impacting groundwater in RainWise areas not analyzed by Kindred and McCormack (2012) are not known, but are presumed to be similar to the areas that were analyzed. SPU is currently planning to conduct a similar analysis for those areas not examined by Kindred and McCormack. Those results would be used to modify the number, density, or other characteristics of RainWise projects in those areas, as appropriate.

To mitigate impacts related to infiltrating ground water, the Program requires that rain garden installations follow the Stormwater Code restrictions on setbacks from mapped steep slopes. To ensure stability of rockeries and walls, raingardens are also required to be set back some distance from those features (the distance depending on the height of any specific rockery or wall). Finally, the Program requires that raingardens be no closer than 10 feet from residential structures with basements.

**B4. Plants**

**a. Types of vegetation found on the site: [check the applicable boxes]**

<input checked="" type="checkbox"/> Deciduous trees:	<input checked="" type="checkbox"/> Alder	<input checked="" type="checkbox"/> Maple	<input type="checkbox"/> Aspen	<input type="checkbox"/> Other:
<input checked="" type="checkbox"/> Evergreen trees:	<input checked="" type="checkbox"/> Fir	<input checked="" type="checkbox"/> Cedar	<input checked="" type="checkbox"/> Pine	<input checked="" type="checkbox"/> Other: Redcedar
<input checked="" type="checkbox"/> Shrubs:				
<input checked="" type="checkbox"/> Grass (turf)				
<input type="checkbox"/> Pasture				
<input type="checkbox"/> Crop or grain				
<input type="checkbox"/> Wet soil plants:	<input type="checkbox"/> Cattail	<input type="checkbox"/> Buttercup	<input type="checkbox"/> Bulrush	<input type="checkbox"/> Skunk cabbage
	<input type="checkbox"/> Other:			
<input type="checkbox"/> Water plants:	<input type="checkbox"/> water lily	<input type="checkbox"/> eelgrass	<input type="checkbox"/> milfoil	<input type="checkbox"/> Other:
<input type="checkbox"/> Other types of vegetation:				

**b. What kind and amount of vegetation would be removed or altered?**

Generally, the Puget Sound basin is home to a wide diversity of plant species that depend upon marine, estuarine, freshwater, and terrestrial environments. The planning area has a broad variety of vegetation, including upland forest (deciduous, coniferous, and mixed), shrublands, riparian forests, and wetlands. This flora includes species native to the region, as well as many non-native species. Seattle is a densely developed urban area having few remaining areas of native vegetation and high-quality habitat. These remaining fragments of quality native vegetation are found in parklands and open spaces throughout the planning area. The plants found in most urban and suburban areas are cultivated species and those native and non-native species that tolerate or benefit from habitat degradation and disturbance.

Typically, the project sites where raingardens and cisterns would be installed have already been extensively altered by construction, operation, and maintenance of structures and paved surfaces. Turf and non-native ornamental shrubs dominate on those sites. Trees would rarely, if ever, be removed to specifically create space for a raingarden or cistern.

**c. List threatened or endangered species known to be on or near the site.**

Typically, the project sites where raingardens and cisterns would be installed have already been extensively altered by construction, operation, and maintenance of structures and paved surfaces. Turf and ornamental shrubs dominate on those sites, which would not present habitat for threatened or endangered plant species. However, no federally listed endangered or threatened plant species or State-listed sensitive plant species are known to occur within the municipal limits of the City of Seattle.

**d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:**

Raingarden and cistern installation could remove or alter existing vegetation. It is unlikely that trees would be removed to create space for the installation of a cistern or raingarden, but tree root zones could be disturbed. Those impacts would be distributed over a large planning area on relatively small and predominantly residential parcels over a period of several years. Installed raingardens would be landscaped with a diversity of native and non-native plant species.

**B5. Animals**

**a. Birds and animals that have been observed on or near the site or are known to be on or near the site: [check the applicable boxes]**

<b>Birds:</b>	<input checked="" type="checkbox"/> Hawk	<input checked="" type="checkbox"/> Heron	<input checked="" type="checkbox"/> Eagle	<input checked="" type="checkbox"/> Songbirds
	<input checked="" type="checkbox"/> Other: crow, pigeon, gull			
<b>Mammals:</b>	<input type="checkbox"/> Deer	<input type="checkbox"/> Bear	<input type="checkbox"/> Elk	<input type="checkbox"/> Beaver
	<input checked="" type="checkbox"/> Other: rat, opossum, raccoon			
<b>Fish:</b>	<input type="checkbox"/> Bass	<input checked="" type="checkbox"/> Salmon	<input checked="" type="checkbox"/> Trout	<input checked="" type="checkbox"/> Herring
	<input checked="" type="checkbox"/> Shellfish	<input type="checkbox"/> Other:		

Generally, the Puget Sound basin is home to a wide diversity of animal species that depend upon marine, estuarine, freshwater, and terrestrial environments. This fauna includes species native to the region, as well as many non-native species. Seattle is an intensely developed urban area having few remaining areas of native vegetation and high-quality habitat. These remaining fragments of quality wildlife habitat are found in parklands and open spaces throughout the planning area. The wildlife found in most urban areas are those native and non-native species that tolerate or benefit from habitat degradation or close association with humans.

**b. List any threatened or endangered species known to be on or near the site:**

In King County, five wildlife species are listed as endangered or threatened under the federal Endangered Species Act (ESA) but are not likely to be found in the planning area. These include Canada lynx (*Lynx canadensis* Threatened), gray wolf (*Canis lupus*; Endangered), grizzly bear (*Ursus arctos*; Endangered), marbled murrelet (*Brachyramphus marmoratus*; Threatened), and northern spotted owl (*Strix occidentalis caurina*; Threatened). King County contains federally designated critical habitat for marbled murrelet and northern spotted owl; no designated critical habitat is located in Seattle. Bald eagle (*Haliaeetus leucocephalus*) was removed from the federal list under ESA on August 8, 2007, but is protected under the federal Bald and Golden Eagle Protection Act. Bald eagle is known to occur in Seattle.

Fish species listed as endangered or threatened under the ESA and found in freshwater tributaries of Puget Sound (PS) include Chinook salmon (*Oncorhynchus tshawytscha*, Threatened, PS), steelhead (*O. mykiss*, Threatened, PS), and bull trout (*Salvelinus confluentus*, Threatened, PS). Coho salmon (*O. kisutch*) is a Candidate species for listing as Threatened. All of these species reside in or near the planning area. Lake Washington contains federally designated critical habitat for bull trout and Chinook salmon.

Because project sites potentially affected by the Program have been previously developed and the original habitats significantly altered or eliminated, the potential for threatened or endangered animal species to be present on or near these sites is low to non-existent. Impacts would be distributed over a large planning area on relatively small and predominantly residential upland parcels over a period of several years.

**c. Is the site part of a migration route? If so, explain.**

The Puget Sound region is known to be an important migratory route for many animal species. Portions of the planning area provide migratory corridors for bald eagles traveling to and from foraging areas in Puget Sound or Lake Washington. Marbled murrelets travel through the planning area between marine waters and their nests in late successional/old growth forests in the Cascade Mountains. Bull trout, steelhead, and Chinook, chum, pink, and coho salmon use the Puget Sound nearshore. Chinook, coho, and sockeye salmon use Lake Washington and Lake Union as migration corridors. Anadromous trout and salmon migrate through the area river and stream systems, including urban streams in Seattle. The Puget Sound region is also within the Pacific Flyway—a flight corridor for migrating waterfowl, migratory songbirds, and other birds. The Pacific Flyway extends from Alaska to Mexico and South America.

**d. Proposed measures to preserve or enhance wildlife, if any:**

The Program's goal of disconnecting pervious surfaces from the City's piped combined sewage collection system is expected to result in improved habitat and water quality conditions in the City's receiving waters. An additional anticipated benefit of this Program is that this increased infiltration would recharge ground water aquifers. Such increased recharge of regional and local aquifers could result in higher baseflows in streams fed by these aquifers. Generally, higher baseflows during summer and fall months are considered a positive change for fish populations. Higher baseflows during winter and spring months are not considered to be adverse impacts.

**B6 Energy and Natural Resources**

**a. What kinds of energy (electric, natural gas, oil, wood stove, solar) would be used to meet the completed project's energy needs? Describe whether it would be used for heating, manufacturing, etc.**

Installed raingardens and cisterns would not require any supplementary energy to operate.

**b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.**

Installed raingardens and cisterns would not involve building structures or planting vegetation that blocks access to the sun for adjacent properties.

**c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:**

There are no conservation features or proposed measures to reduce or control energy impacts.

**B7. Environmental Health**

- a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe:**

Materials possibly present during installation of raingardens and cisterns would include gasoline and diesel fuels, hydraulic fluids, oils, lubricants, and other chemical products. A spill of one of these chemicals could potentially occur during installations as a result of either equipment failure or worker error.

- (1) Describe special emergency services that might be required.**

Program implementation would not require special emergency services, either during construction or once the raingardens and cisterns are installed. Typical emergency services required for medical emergencies during construction would be provided by the Seattle Fire Department. Typical security services during construction would be provided by the Seattle Police Department, private property owners, and project contractors.

- (2) Proposed measures to reduce or control environmental health hazards, if any:**

If required for individual installations, a hazardous material and spill control plan would be developed to control spills on installation sites. In areas of suspected contamination, soil testing might be conducted prior to construction to determine the extent of contamination. Contaminated soils would be excavated and disposed of in a manner consistent with the level of contamination, in accordance with federal, state and local regulatory requirements, by a qualified contractor(s).

**b. Noise**

- (1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?**

Existing noise levels include a variety of noise sources that are characteristic of an intensively developed urban area. Noises that exist in the area would not affect installed projects.

- (2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.**

Noise levels in the vicinity of construction would temporarily increase during construction activities. Short-term noise from construction equipment would be limited to the allowable maximum levels of City of Seattle's Noise Control Ordinance (SMC Chapter 25.08).

Per SMC 25.08, elevated noise from construction equipment would be allowed only between the hours of 7 am and 10 pm weekdays, and between 9 am and 10 pm on weekends and legal holidays. Installations typically would take place between 7 am to 6 pm on weekdays. There would be no additional noise after completion of the installations.

**(3) Proposed measures to reduce or control noise impacts, if any:**

Construction equipment would be muffled in accordance with the applicable laws. SMC Chapter 25.08 (which prescribes limits to noise and construction activities) would be enforced while individual projects are being installed.

**B8. Land and Shoreline Use**

**a. What is the current use of the site and adjacent properties?**

RainWise rebates will be offered to private property owners with properties in the areas shown in Attachment A. Specific sites cannot be determined at this time. Most of the sites are expected to be residential properties, but the rebate program is also available for other types of private properties such as churches or businesses. In addition, SPU may install up to 12 installations on public parcels.

**b. Has the site been used for agriculture? If so, describe.**

Most areas within the City of Seattle have never been used for agricultural purposes. However, some locations have been used in the past as truck farms, orchards, community gardens, or other agricultural enterprises. Thus, it is possible that some raingardens could be installed on parcels that have been used historically for agricultural purposes. However, that agricultural context would have been lost prior to the construction of this Program's raingardens because those parcels would have been involved in the redevelopment of that land from agriculture to other uses such as residences.

**c. Describe any structures on the site.**

Existing uses include single-family and multifamily residences, commercial, industrial, recreation, and open space. Most properties have been developed at urban densities and existing uses are often mixed. All affected parcels would have structures present—residential structures, primarily. Some sites may have schools, commercial buildings, or community-type structures present.

**d. Will any structures be demolished? If so, what?**

Program implementation would not demolish any structures.

**e. What is the current zoning classification of the site?**

Zoning in Seattle includes a range of residential, commercial, industrial, public, and open space designations. The City also has a number of special overlay districts with specific land use restrictions. It is not possible to identify all potential RainWise sites at this time, so site-specific zoning classifications cannot be determined. Most raingarden and cistern installations are expected to occur within the Single Family (SF) zone but could occur in other zones.

**f. What is the current comprehensive plan designation of the site?**

The City of Seattle's *Comprehensive Plan* designations are diverse within the planning area. It is not possible to identify all potential RainWise sites at this time, so site-specific comprehensive plan designations cannot be determined.

**g. If applicable, what is the current shoreline master program designation of the site?**

The planning area contains both freshwater and marine shorelines. Some installations of raingardens and cisterns may occur within a 200 foot shoreline district and thus be subject to the City's shoreline master program. Prior to installation of raingardens and cisterns, individual private landowners would need to apply for and obtain any applicable land use permits and approvals, including applicable shoreline substantial development permits, variances, or conditional use permits.

**h. Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.**

Some raingarden and cistern installations could affect environmentally sensitive areas and be subject to the City's critical areas regulations. Critical areas include geologic and seismic hazards, flood prone areas, riparian corridors, wetlands, and fish and wildlife habitat conservation areas. No raingarden or cistern installations would be installed in wetlands or within 300 feet of mapped steep slopes or near known landslide areas.

**i. Approximately how many people would reside or work in the completed project?**

Program implementation would not include any residential or commercial development. No people would reside or work in the installed raingarden facilities or cisterns.

**j. Approximately how many people would the completed project displace?**

No people would be displaced by the Program.

**k. Proposed measures to avoid or reduce displacement impacts, if any:**

No mitigation measures are proposed because there would be no displacement impacts.

**l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:**

Prior to installation of raingardens and cisterns, individual private landowners would need to apply for and obtain applicable land use permits and approvals, including applicable shoreline substantial development permits, variances, or conditional use permits. Implementation of the Program is consistent with current land uses and plans.

**B9. Housing**

**a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.**

The Program would not construct any housing units.

**b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.**

The Program would not remove any housing units.

**c. Proposed measures to reduce or control housing impacts, if any:**

No measures are proposed because there would be no housing impacts.

**B10. Aesthetics**

- a. What is the tallest height of any proposed structure(s), not including antennas? What is the principal exterior building material(s) proposed?**

No building structures or other above-ground structures are proposed.

- b. What views in the immediate vicinity would be altered or obstructed?**

No views would be altered or obstructed. Installed raingardens would be located at and below existing grades. Cisterns would be above grade, but have low profiles.

- c. Proposed measures to reduce or control aesthetic impacts, if any:**

There would be no adverse aesthetic impacts as a result of implementing this Program.

**B11. Light and Glare**

- a. What type of light or glare would the proposal produce? What time of day would it mainly occur?**

Raingarden and cistern installations would be conducted during daylight hours. The completed installations would not produce glare.

- b. Could light or glare from the finished project be a safety hazard or interfere with views?**

Completed installations would not produce glare.

- c. What existing off-site sources of light or glare may affect your proposal?**

There are no existing off-site sources of light and glare that would affect Program implementation.

- d. Proposed measures to reduce or control light and glare impacts, if any:**

Because neither the completed installations nor their installation would produce glare, no mitigation measures are being proposed.

**B12. Recreation**

- a. What designated and informal recreational opportunities are in the immediate vicinity?**

The planning area has a variety of designated and informal recreational opportunities, including City parks, trails, gardens, playfields, swimming pools, community centers, golf courses, school playgrounds, fishing piers, and private health clubs. Puget Sound, Lake Washington, Lake Union, and other water bodies also offer water-related recreation such as swimming, boating, fishing, use of public beaches, and scuba diving.

**b. Would the proposed project displace any existing recreational uses? If so, describe.**

Specific installations of raingardens or cisterns may temporarily and briefly detour vehicles, pedestrians, joggers, and bicyclists around the work area. However, completed projects would have no impact on public rights-of-way or agency-owned parcels and would not permanently displace any recreational uses.

**c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:**

Specific installations of raingardens or cisterns may temporarily and briefly detour vehicles, pedestrians, joggers, and bicyclists around the work area. However, completed projects would have no impacts on public rights-of-way or agency-owned parcels and would not permanently displace any recreational uses. Because Program implementation would have no permanent recreational impacts, no measures to reduce or control recreational impacts are proposed.

**B13. Historic and Cultural Preservation**

**a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.**

Seattle includes a number of landmarks, properties, or districts that are listed on, or proposed for, national, state, and local preservation registers. In addition, Seattle is an area with known and potential sites of archaeological importance. The Program has not identified all potential individual projects or affected parcels. Therefore, the proximity of historic landmarks or properties cannot be determined at this time.

**b. Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.**

Seattle includes a number of landmarks, properties, or districts that are listed on, or proposed for, national, state, and local preservation registers. In addition, Seattle is an area with known and potential sites of archaeological importance. The Program has not identified all potential individual projects or affected parcels. Therefore, the proximity of any historically, archaeologically, scientifically, or culturally important landmarks or evidence cannot be determined at this time.

**c. Proposed measures to reduce or control impacts, if any:**

Private property owners are responsible for complying with any applicable federal, state, and local regulations and for obtaining any required permits for work on their property. SPU would be responsible for complying with regulations and obtaining any required permits for demonstration rain gardens and cisterns on publicly owned parcels. Generally, most—if not all—RainWise installations are expected to be in previously disturbed areas and not expected to affect historic or cultural resources.

**B14. Transportation**

- a. Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.**

Seattle has a variety of transportation facilities, including roadways, bicycle paths, railroads, airports, ferries, and public transit.

- b. Is the site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?**

Seattle has a variety of transportation facilities, including roadways, bicycle paths, railroads, airports, ferries, and public transit.

- c. How many parking spaces would be unavailable during project construction? How many spaces would the completed project have? How many would the project eliminate?**

Program implementation would not permanently eliminate parking spaces. However, installation of raingardens and cisterns at any specific project location may require the temporary closure of up to two on-street, public parking spaces. Those impacts would be distributed over a large planning area on predominantly residential parcels over a period of several years.

- d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).**

Program implementation would not require any new roads or improvement to existing roads. All raingardens and cisterns would be installed on private property.

- e. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.**

Some installed raingardens and cisterns may be located near water, rail, or air transportation, but no such projects would use those modes of transportation.

- f. How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.**

Installation of 3,005 raingardens between May 2012 and December 2017 would generate an estimated 30,000 vehicle round-trips due to workers and materials being transported to and from project sites (assuming a maximum 5 working day installation period for each site). Most of those trips would occur during business hours (between 7 am and 6 pm) on weekdays (Mondays through Fridays). The vehicle round trips would be distributed through the affected CSO basins in the City over that 6.5 year period. The installed raingardens and cisterns would not generate vehicle round trips.

- g. Proposed measures to reduce or control transportation impacts, if any:**

Temporary closures and emergency access would comply with relevant policies administered by the Seattle Department of Transportation (SDOT) as part of their Street Use permitting process, as applicable.

**B15. Public Services**

- a. **Would the project result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.**

Project implementation is not expected to create increased need for public services. Installation of raingardens and cisterns may temporarily and briefly detour vehicles, pedestrians, joggers, and bicyclists around specific project work areas. Installations would be required at all times to accommodate emergency access. Such detours and emergency access would comply with relevant policies administered by SDOT as part of their Street Use permitting process, as applicable.

- b. **Proposed measures to reduce or control direct impacts on public services, if any.**

Installations would be required at all times to accommodate emergency access. Such detours and emergency access would comply with relevant policies administered by SDOT as part of their Street Use permitting process, as applicable. Otherwise, no mitigation is being proposed because the completed project would have no adverse impacts on public services.

**B16. Utilities**

- a. **Check utilities available at the site, if any: [check the applicable boxes]**

Electricity     Natural gas     Water     Refuse service  
 Telephone     Sanitary sewer     Septic system  
 Other: Fiber/Cable

Seattle has a variety of utilities, including those checked above.

- b. **Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.**

**None**

No new utilities are being proposed. No interruptions of utilities or services are anticipated as a result of the installation of raingardens or cisterns.

**C. SIGNATURE**

The above answers are true and complete to the best of my knowledge. I understand the lead agency is relying on them to make its decision.

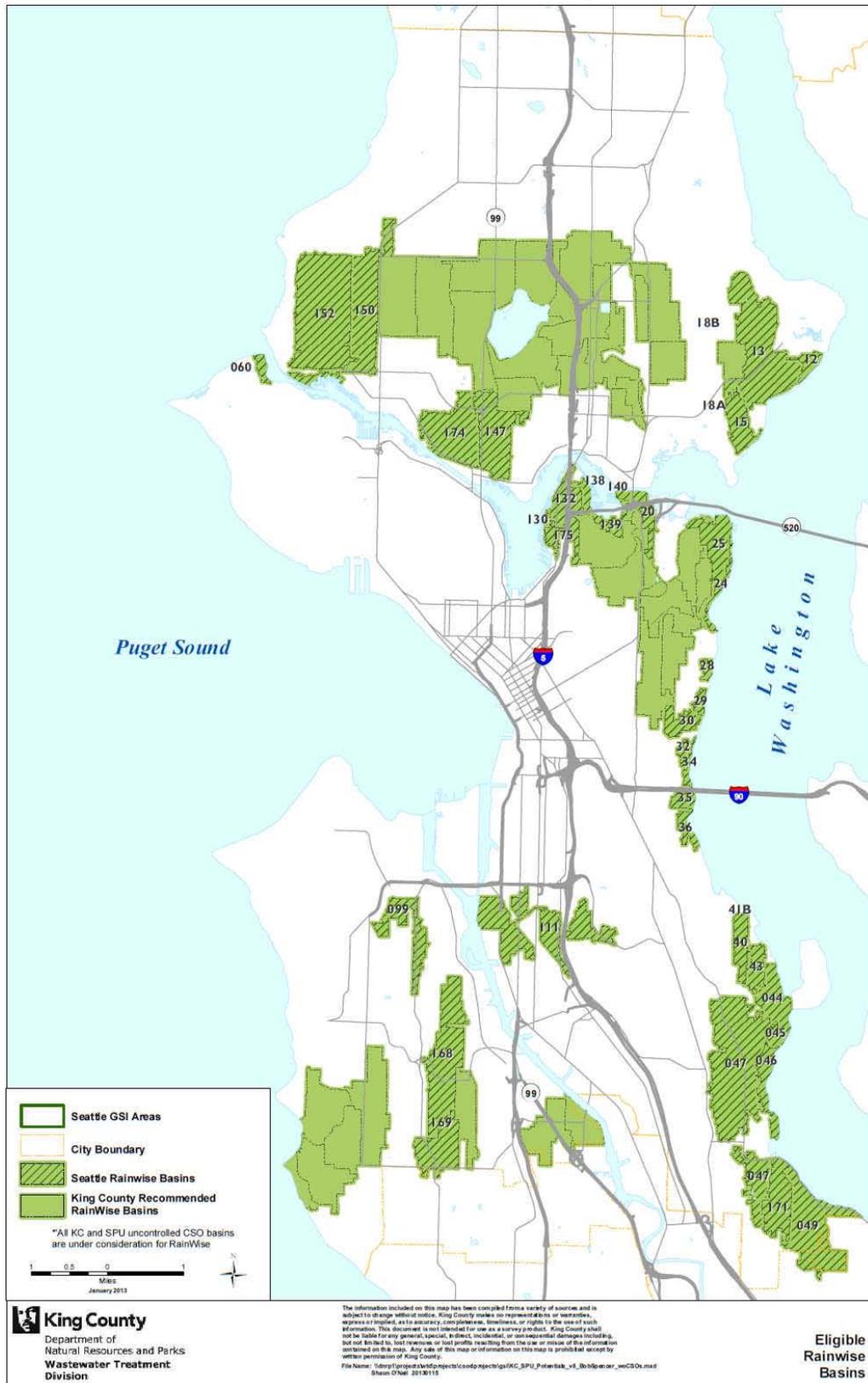
Signature: \_\_\_\_\_

*Bob Spencer, Program Manager*  
Seattle Public Utilities

Date: \_\_\_\_\_

*2-5-13*

### Attachment A: Location Map



## Attachment B: Greenhouse Gas Emissions Worksheet

Section I: Buildings						
			Emissions Per Unit or Per Thousand Square Feet (MTCO <sub>2</sub> e)			
Type (Residential) or Principal Activity (Commercial)	# Units	Square Feet	Embodied	Energy	Transportation	Lifespan Emissions (MTCO <sub>2</sub> e)
Single-Family Home	0		98	672	792	0
Multi-Family Unit in Large Building	0		33	357	766	0
Multi-Family Unit in Small Building	0		54	681	766	0
Mobile Home	0		41	475	709	0
Education		0.0	39	646	361	0
Food Sales		0.0	39	1,541	282	0
Food Service		0.0	39	1,994	561	0
Health Care Inpatient		0.0	39	1,938	582	0
Health Care Outpatient		0.0	39	737	571	0
Lodging		0.0	39	777	117	0
Retail (Other than Mall)		0.0	39	577	247	0
Office		0.0	39	723	588	0
Public Assembly		0.0	39	733	150	0
Public Order and Safety		0.0	39	899	374	0
Religious Worship		0.0	39	339	129	0
Service		0.0	39	599	266	0
Warehouse and Storage		0.0	39	352	181	0
Other		0.0	39	1,278	257	0
Vacant		0.0	39	162	47	0
<b>TOTAL Section I Buildings</b>						<b>0</b>

Section II: Pavement						
						Emissions (MTCO <sub>2</sub> e)
Concrete/Asphalt (50 MTCO <sub>2</sub> e/1,000 sq ft of pavement, 6 inches thick)*			N/A			0
<b>TOTAL Section II Pavement</b>						<b>0</b>

\*King County SEPA GHG emissions Worksheet Bulletin 26, Version 1.7, December 26, 2007

Section III: Construction						
						Emissions (MTCO <sub>2</sub> e)
(See detailed calculations below)						
<b>TOTAL Section III Construction</b>						<b>653</b>

Section IV: Operation and Maintenance						
						Emissions (MTCO <sub>2</sub> e)
(See detailed calculations below)						
<b>TOTAL Section IV Operations and Maintenance</b>						<b>0</b>

<b>TOTAL GREENHOUSE GAS (GHG) EMISSIONS FOR PROGRAM (MTCO<sub>2</sub>e)</b>						<b>653</b>
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Section III Construction Details		
Construction: Diesel		
Equipment	Diesel (gallons)	Assumptions
Bobcat Excavator	24,040	4 hours x 2 gallons/hour (66 hp engine) x 3,005 installations
<b>Subtotal Diesel Gallons</b>	24,040	
<b>GHG Emissions in lbs CO<sub>2</sub>e</b>	638,262	At 26.55 lbs CO <sub>2</sub> e per gallon of diesel
<b>GHG Emissions in metric tons CO<sub>2</sub>e</b>	289	1,000 lbs = 0.45359237 metric tons

Construction: Gasoline		
Equipment	Gasoline (gallons)	Assumptions
Pick-up Trucks	30,050	5 workdays x 2 trucks x 1 round-trip/day x 20 miles/round-trip ÷ 20 mpg x 3,005 installations
Sodcutter	1,503	1 hour x 0.5 gallons/hour x 3,005 installations
Rototiller	1,503	1 hour x 0.5 gallons/hour x 3,005 installations
<b>Subtotal Gasoline Gallons</b>	33,956	
<b>GHG Emissions in lbs CO<sub>2</sub>e</b>	803,261	At 24.3 lbs CO <sub>2</sub> e per gallon of gasoline
<b>GHG Emissions in metric tons CO<sub>2</sub>e</b>	364	1,000 lbs = 0.45359237 metric tons

Construction Summary		
Activity	CO <sub>2</sub> e in pounds	CO <sub>2</sub> e in metric tons
Diesel	638,262	289
Gasoline	803,261	364
<b>Total for Construction</b>	1,441,523	<b>653</b>

Section IV Long-Term Operation and Maintenance Details		
Operation and Maintenance: Diesel		
Equipment	Diesel (gallons)	Assumptions
	0	
<b>Subtotal Diesel Gallons</b>	0	
<b>GHG Emissions in lbs CO<sub>2</sub>e</b>	0	At 26.55 lbs CO <sub>2</sub> e per gallon of diesel
<b>GHG Emissions in metric tons CO<sub>2</sub>e</b>	0	1,000 lbs = 0.45359237 metric tons

Operation and Maintenance: Gasoline		
Equipment	Gasoline (gallons)	Assumptions
	0	
<b>Subtotal Gasoline Gallons</b>	0	
<b>GHG Emissions in lbs CO<sub>2</sub>e</b>	0	At 24.3 lbs CO <sub>2</sub> e per gallon of gasoline
<b>GHG Emissions in metric tons CO<sub>2</sub>e</b>	0	1,000 lbs = 0.45359237 metric tons

Operation and Maintenance Summary		
Activity	CO <sub>2</sub> e in pounds	CO <sub>2</sub> e in metric tons
Diesel	0	0
Gasoline	0	0
<b>Total Operations and Maintenance</b>	0	<b>0</b>