

# **SALMON CREEK COMPREHENSIVE DRAINAGE BASIN PLAN**



## **PHASE II: ALTERNATIVES ANALYSIS AND RECOMMENDATIONS**

**June, 2004**

**Prepared by:**

**Thurston County Department of Water and Waste Management  
Storm and Surface Water Utility  
Olympia, WA**

**Partially Funded by:**

**Washington State Department of Ecology  
Flood Control Account Assistance Program  
Grant No. G0200089 and**

**Thurston County Storm and Surface Water Utility Rates**

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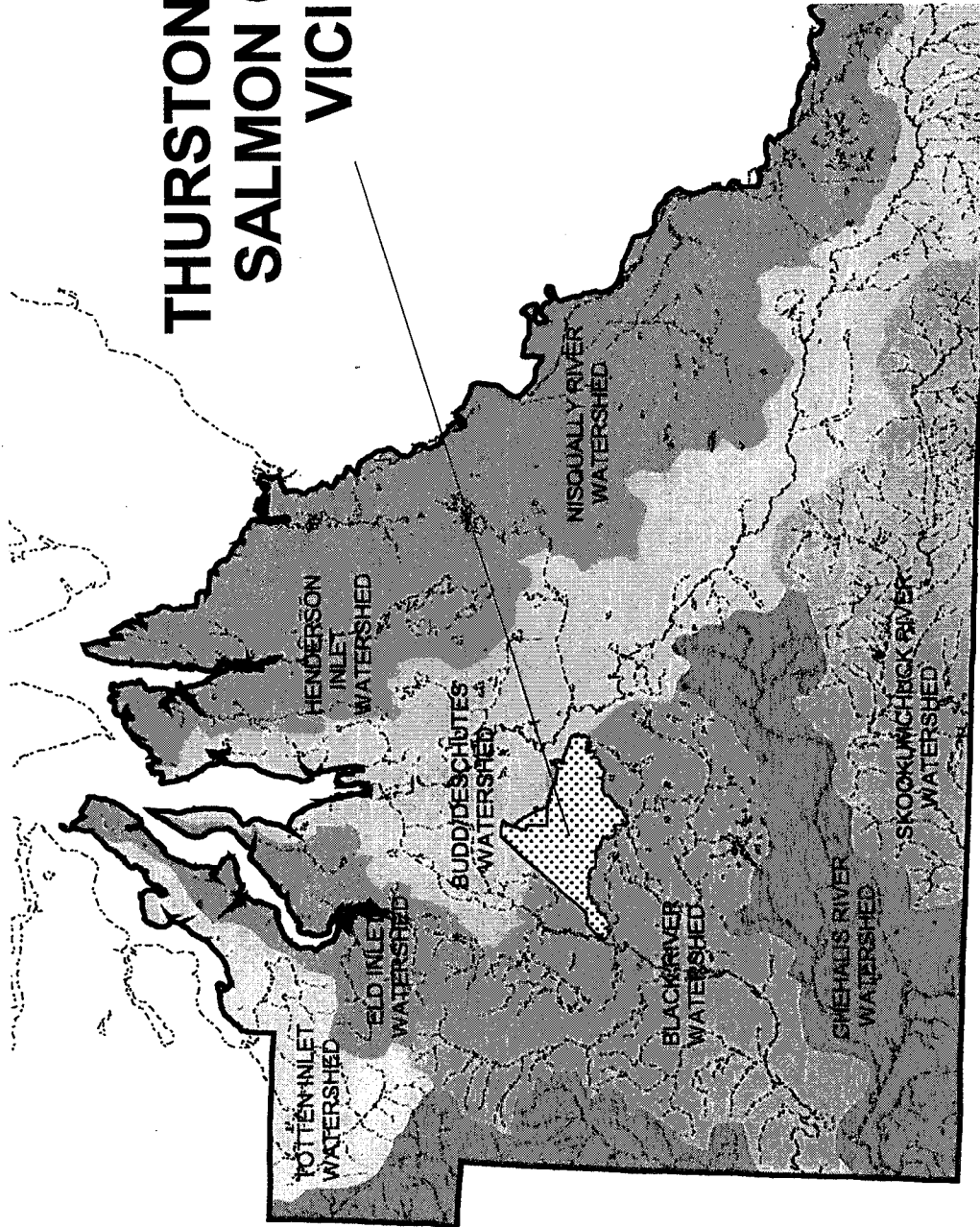
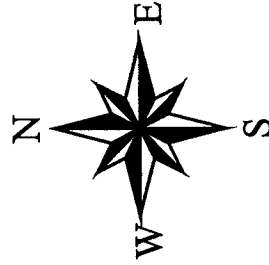
**Thurston County Department of Water and Waste Management  
Storm and Surface Water Utility  
Olympia, WA**

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Grant No. G0200089 and**

**Thurston County Storm and Surface Water Utility Rates**

# THURSTON COUNTY, WA SALMON CREEK BASIN VICINITY MAP



## ACKNOWLEDGEMENTS

### SALMON CREEK STAKEHOLDERS COMMITTEE

#### *Chairperson:*

Bill Cullen

#### *Residential Representatives:*

Chuck Cline  
Dawn Kendrick McVeigh  
Charles Reed

#### *Commercial Industrial Representatives:*

Marvin Kaufman  
Keith Laws  
Terry Trafton

#### *Agricultural Representatives:*

Michael McManus  
Bob Oderman  
Bill Pritchett

#### *Agency Representatives:*

|                    |  |
|--------------------|--|
| Liz Lyman          | Thurston County Planning Commission                    |
| Dick Allen         | Thurston County Storm and Surface Water Advisory Board |
| Jim Bettridge      | Hopkins Ditch District                                 |
| Debbie Carnevali   | Washington State Department of Fish and Wildlife       |
| Veronica Fernandes | Tumwater Planning Commission                           |
| Heber Kennedy      | Port of Olympia  |
| Peter Kmet         | City of Tumwater                                       |
| Dr. C.S. Sodhi     | Chehalis Tribe (original participant)                  |
| Ramon Iyer         | Chehalis Tribe   |
| Dan Sokol          | Washington State Department of Ecology                 |

### THURSTON COUNTY STAFF

|              |                  |                |             |
|--------------|------------------|----------------|-------------|
| Dick Blinn   | Jim Bachmeier    | Kevin Dragon   | Scott Clark |
| Tom Clingman | Susie Vanderburg | Laura McDowell |             |
| Mark Cook    | Darin Cramer     | Marie Cameron  |             |

### THURSTON REGIONAL PLANNING COMMISSION STAFF

|               |             |
|---------------|-------------|
| Veena Tabbutt | Scott Carte |
|---------------|-------------|

### CITY OF TUMWATER STAFF

|                |               |
|----------------|---------------|
| Kathy Callison | Mike Mattlock |
|----------------|---------------|

### CONSULTANTS

|                 |                           |                    |
|-----------------|---------------------------|--------------------|
| URS Corporation | Pacific Groundwater Group | Brown and Caldwell |
|-----------------|---------------------------|--------------------|

RESOLUTION NO. 13177

A RESOLUTION adopting the Salmon Creek Comprehensive Drainage Basin Plan Phase II: Alternatives Analysis and Recommendations (SCBP) (2004) and establishing criteria for implementing Plan recommendations.

WHEREAS, the Salmon Creek Basin consists of approximately 7,500 acres generally bounded on the north by the southern Tumwater City Limits, on the south by 113<sup>th</sup> Avenue, on the west by Littlerock Road and on the east just past Brooks Lane; and

WHEREAS, the Board of County Commissioners (Board) in 1999 authorized a scientific study of the Salmon Creek Basin after above average precipitation in the winters of 1996/97 and 1998/99 flooded homes, septic systems, and roads, and contaminated domestic drinking water wells; and

WHEREAS, the County has established interim standards for development in the Salmon Creek Basin, and modified critical areas ordinances to address the Salmon Creek Basin; and

WHEREAS, the SCBP was developed between 1999 and 2003 by the Salmon Creek Basin Stakeholders Committee, an advisory committee representing basin property owners, local jurisdictions and state agencies; and

WHEREAS, the SCBP makes sixteen recommendations for helping to reduce flooding impacts within the planning area; and

WHEREAS, the Board held a Public Hearing on the SCBP on January 28, 2004, after which the Board considered public comments, and held a joint work session with the Tumwater City Council on March 18, 2004 to review and discuss the SCBP; and

WHEREAS, the SCBP received a State Environmental Policy Act (SEPA) "Determination of Non-Significance" on January 27, 2004; and

WHEREAS, on May 4, 2004 the City of Tumwater approved Resolution R2004-012, adopting the SCBP as means to support consistent regulatory and land use actions across jurisdictional boundaries.

NOW, THEREFORE, THE BOARD OF COMMISSIONERS OF THURSTON COUNTY DOES RESOLVE AS FOLLOWS:

Section 1. The Board hereby adopts the Salmon Creek Comprehensive Drainage Basin Plan Phase II: Alternatives Analysis and Recommendations (2004).

Section 2. Thurston County, by and through its Department of Water and Waste Management, Storm and Surface Water Utility, shall implement the recommendations set forth in Chapter 7 of the Salmon Creek Comprehensive Drainage Basin Plan Phase II: Alternatives Analysis and Recommendations (2004) subject to the prioritization of said recommendations with the recommendations of all other adopted stormwater comprehensive drainage basin plans; the terms and conditions of any Interlocal Cooperation Agreement with participating cities and other jurisdictions implementing any recommendations of this plan; the priorities set forth in the Storm and Surface Water Utility's Capital Facilities Plan; and the availability of funds.

ADOPTED June 28, 2004

ATTEST BY:

BOARD OF COUNTY COMMISSIONERS  
Thurston County, Washington

Ld Bonita P. Boydman  
Clerk of the Board

Marie Oleguer  
Chairman

Approved as to form:  
EDWARD HOLM  
PROSECUTING ATTORNEY

Robert W. Mackel  
Commissioner

By: Kristin Larson Doyle  
Kristin Larson Doyle  
Deputy Prosecuting Attorney

Carly Haege  
Commissioner

## RESOLUTION NO. R2004-012

---

A RESOLUTION adopting the Salmon Creek Comprehensive Drainage Basin Plan.

WHEREAS, the city of Tumwater has delineated certain areas as its Urban Growth Area; and

WHEREAS, the city has adopted the boundaries of the Urban Growth Area; and

WHEREAS, the Urban Growth Area includes a portion of the Salmon Creek Basin; and

WHEREAS, the Salmon Creek Basin experiences periodic flooding due to high groundwater levels; and

WHEREAS, a Salmon Creek Basin Advisory Committee was established, including a representative from the City of Tumwater; and

WHEREAS, Thurston County has studied the flooding problem and identified recommendations to address the problem in part; and

WHEREAS, Thurston County has established interim standards for development in the Salmon Creek Basin, and has modified critical areas ordinances to address the Salmon Creek Basin; and

WHEREAS, the City Council wishes to act in a way that supports consistent regulatory and land use actions across jurisdictional boundaries; and

WHEREAS, the LOTT Wastewater Alliance has stated that it will not locate any infiltration facilities for reclaimed water in the Salmon Creek Basin; and

WHEREAS, the City Council held a hearing on the Salmon Creek Comprehensive Drainage Basin Plan on May 4, 2004;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF TUMWATER AS FOLLOWS:

Section 1. The City Council hereby adopts the Salmon Creek Comprehensive Drainage Basin Plan subject to the following terms and conditions:


A. The LOTT Wastewater Alliance will not be allowed to locate any infiltration facilities for reclaimed water in the Salmon Creek Basin;

B. Any drainage projects developed pursuant to the plan will be sized to accommodate future development to the extent feasible; and

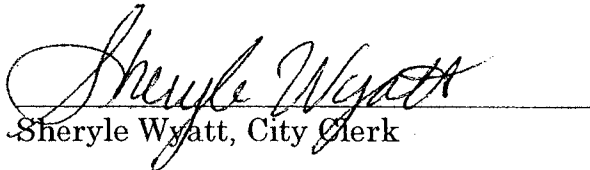
C. The Tumwater City Council will work together with the Thurston County Board of Commissioners to develop a joint funding plan that reflects their mutual interest to implement plan recommendations where technically and economically feasible.

ADOPTED this fourth (4<sup>th</sup>) day of May, 2004.

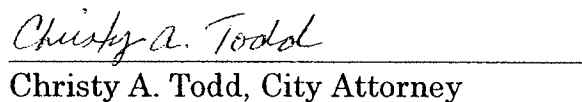
CITY OF TUMWATER

  
Ralph C. Osgood, Mayor

ATTEST:

  
Sheryle Wyatt, City Clerk

APPROVED AS TO FORM:

  
Christy A. Todd, City Attorney



**DETERMINATION OF NONSIGNIFICANCE**

**Proponent:**

Thurston County Department of Water and Waste Management  
921 Lakeridge Drive, SW, Room 100  
Olympia, WA 98502  
Contact: Jim Bachmeier  
(360) 357-2491

**Description of Proposal:**

This SEPA review is for the Salmon Creek Comprehensive Drainage Plan, Phase II: Alternatives Analysis and Recommendations. The above plan is a comprehensive analysis of flood-relief alternatives and recommendations for future actions by the City of Tumwater, Thurston County, and other entities to reduce and prevent flooding impacts to individual property owners and City and County Roads within the Salmon Creek Drainage Basin. The proposed adoption of the plan is not associated with a specific development proposal and has been reviewed as a Nonproject Action, in accordance with the requirements of the State Environmental Policy Act (SEPA). All specific proposals will be required to apply for project specific permits and meet all current regulations at the time of application.

Attached is a brief Executive Summary of the Salmon Creek Comprehensive Drainage Basin Plan. If you would like a more detailed description of any one of these proposed changes, please contact Jim Bachmeier at the above-listed telephone number.

**Location of Proposal:**

Thurston County

**Section/Township/Range:**

N/A

Tax Parcel No.:

N/A

**Threshold Determination:**

The lead agency for this proposal has determined that it does not have a probable significant adverse impact upon the environment. An Environmental Impact Statement is not required under RCW 43.21C.030(2)(C). This decision was made after review by the Lead Agency of a completed Environmental Checklist and other information on file with the Lead Agency. This information is available to the public on request.

**Jurisdiction:**

Thurston County

**Lead Agency:**

Development Services

**Responsible Official:**

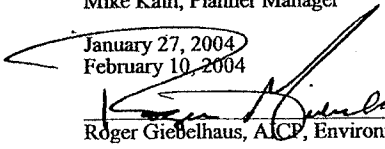
Mike Kain, Planner Manager

**Date of Issue:**

January 27, 2004

**Comment Deadline:**

February 10, 2004

  
Roger Giebelhaus, AICP, Environmental Planner

This Determination of Nonsignificance (DNS) is issued under 197-11-340(2); the lead agency will not act on this proposal for 14 days from the date of issue. No permits may be issued, and the applicant shall not begin work until after the comment and any appeal periods have expired and any other necessary permits are issued. If conditions are added, deleted, or modified during the 14-day review period, a modified DNS will be issued. Otherwise, this DNS will become final after the expiration of the comment deadline and appeal period, if applicable.

**APPEALS:** Threshold determinations may be appealed pursuant to TCC 1709.160 if: (1) a written notice of appeal, meeting the requirements of TCC 17.09.160(4), and the appropriate appeal fee is received by the Thurston County Development Services Department within fourteen calendar days of the date of issuance of the threshold determination or, if there is a comment period under WAC 197-11-340, within seven calendar days of the last day of the comment period; and (2) the person filing the appeal meets the requirements of TCC 17.09.160(2).

**NOTE:** The issuance of this Determination of Nonsignificance does not constitute project approval. The applicant must comply with all applicable requirements of Thurston County Departments and/or the Hearing Examiner prior to receiving permits.

Thurston County Development Services, Roger Giebelhaus  
Building #1, Administration  
2000 Lakeridge Drive SW  
Olympia, WA 98502 (360) 754-3355, ext.7809

cc: Department of Ecology (2)  
Dan Sokol, Department of Ecology  
Thurston Co Roads & Transportation Service  
Roads Development Review  
City of Tumwater, Roger Gellenbeck  
Chehalis Tribe  
Jean Takekawa, U. S. Fish and Wildlife

Thurston Co Environmental Health Dept  
Debbie Carnevali, Dept. Fish & Wildlife  
Department of Fish & Wildlife  
Washington Department of Transportation  
Port of Olympia  
Sub Area #6  
Sue Danver, Audubon Society, Black Hills

**RECEIVED**

FEB 26 2004

Thurston County - Department of  
Water and Waste Management



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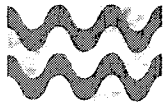
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# EXECUTIVE SUMMARY

## BACKGROUND

Salmon Creek Basin is located in Thurston County, Washington, just south of the Olympia Regional Airport and the Tumwater City limits. The basin is relatively flat and slopes gently toward Salmon Creek, which flows into Black River. The basin boundary encompasses approximately 12 square miles (7,500 acres) from the Tumwater City Limits on the northern boundary, to 113<sup>th</sup> Avenue on its southernmost edge. The western boundary lies along Littlerock Road, and the eastern boundary extends just past Brooks Lane. The area of the basin is defined by the surface and groundwater sources that contribute to recharge of Salmon Creek.

Above-average rainfall caused localized flooding in Salmon Creek Basin in the rainy seasons of 1996-97 and 1998-99. On some properties, the groundwater surfaced as puddles; on others, the water formed lake-like conditions that covered several acres. Property owners experienced a range of inconveniences – from high water around and under homes, to failed septic systems, contaminated drinking water, and restricted access to property.

It is difficult to identify the exact number of properties affected by flooding because not all property owners reported damage. However, as part of a grant-seeking process in 2002, Thurston County identified 100 properties that had likely experienced some level of flooding in 1998-99. The determination was based on flood-reports by owners, groundwater flood maps, and photos. (Of the 100 properties identified, 20 sought relief through the grant process, which is described further in Appendix C of the basin plan.)

In response to the flooding, the Thurston County Board of Commissioners in 1999 appointed a 19-member Salmon Creek Basin Stakeholders Committee. The committee members represented a range of residential, commercial/industrial, and agricultural interests, as well as government agencies. Among its members were representatives from the state Department of Fish and Wildlife, the state Department of Ecology, the Tumwater Planning Commission, the Thurston County Planning Commission, the Port of Olympia, and the City of Tumwater.

### Areas most affected by flooding in 1999

Four areas (sub-basins) of Salmon Creek Drainage Basin experienced substantial flooding and suffered the most damage to structures during the 1999 event (see Figure 4-4 in the basin plan).

SC 9, the triangular-shaped intersection of Littlerock Road and 93<sup>rd</sup> Avenue (216.88 acres flooded in 1999).

SC 10, an area east of Littlerock Road and south of 83<sup>rd</sup>, along Rhondo Street (62.67 acres flooded in 1999).

SC11, an area roughly west and southwest of the intersection between Prine Drive and Interstate 5. This area also extends east of I-5, south of Frontage Road and west of Kimmie Street (128.16 acres flooded in 1999).

SC13, an area northwest of the intersection of 93<sup>rd</sup> and Case Road (71.69 acres flooded in 1999).

The Stakeholders Committee was charged with two tasks. The first task was to prepare a short-term "Emergency Preparedness and Response Plan." Published in late 1999, the plan provides advice on how individuals, community groups, and Thurston County can best prepare for and respond to flooding events.

The second task was to prepare a long-term basin plan that would evaluate ways to actually reduce the impact of flooding. Whereas the Salmon Creek Emergency Preparedness and Response Plan focused on how to *respond* to flooding, the basin plan was meant to be more solution-oriented. The basin plan was expected to explore and provide recommendations on a wide array of approaches – from policy changes that could help protect people from building in flood-prone areas, to engineering fixes that could lower floodwaters on existing properties. This basin plan represents the completion of the second task.

The basin plan itself was also developed in two distinct phases. In Phase I, Thurston County hired a private consulting team consisting of URS Griener Woodward Clyde (now called URS Corporation) and Pacific Groundwater Group to create a computer model to simulate how water flows in Salmon Creek Basin. The model was needed to allow evaluation of potential measures to alleviate flooding problems. In Phase II, the Stakeholders Committee and the consulting firm identified policy and engineering options to alleviate flooding and its impacts. The committee identified the most feasible alternatives, taking into account technical, economic, and regulatory issues. The committee then directed the consultants to model the chosen alternatives using the computer model created in Phase I. The results of the modeling guided the development of this basin plan.

### **Flooding in Salmon Creek Basin**

Most flooding in Salmon Creek Basin is caused by high groundwater tables. This flooding occurs when rainfall causes an underground water table to rise to the surface of the land, flooding low-lying areas. Groundwater can become "surface water" when it rises, ponds at the surface of the land, and then flows aboveground to other areas.

Some areas of the basin experience a combination of ground and surface water flooding. Most notable of these is the sub-basin referred to as SC 9 (the area around Littlerock Road and 93<sup>rd</sup> Avenue). SC 9 not only experiences groundwater flooding but also receives surface flows from SC 10, which lies to the north.

Rainwater runoff from impervious surfaces – such as roads and rooftops – is not a major flooding factor in the basin, because runoff soaks into the porous ground instead of flowing laterally on the surface of the land.

In contrast to groundwater flooding, surface water flooding is caused by water that literally "flows from the surface." Examples include river flooding, water that overflows from ponded areas, and flooding that results from rainwater hitting hard surfaces such as roofs and roads.

Only eight percent of the land in the Salmon Creek Drainage Basin (598 acres) is covered by impervious surfaces.

## **FINDINGS**

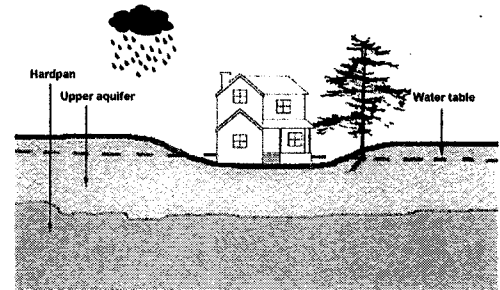
Flooding and flood-related problems in Salmon Creek Basin were found to be the result of extended heavy rainfall in an area with a long history of drainage problems.

The drainage basin is naturally prone to flooding because of the geology and topography. Most of the basin is covered by a very permeable layer of well-sorted, loose sand and gravel. This layer rapidly accepts and stores water. Below this aquifer lies a second layer of dense, compacted

sand and gravel, mixed with silts and clays (commonly referred to as “hardpan” or “glacial till”). This hardpan layer is not very porous and generally slows the downward flow of water from the upper aquifer. (Details of geologic formation can be found in the Phase I study.)

The basin also has little slope; the ground surface drops only 30 feet over four miles. The topographic boundaries in relatively flat areas have also shifted in places because of filling for property development and road construction, particularly along Littlerock Road.

Generally, when the region experiences prolonged periods of above-average rainfall, accompanied by wet springs and cool, mild summers, the upper aquifer fills and overflows into low lying areas. Since the land is virtually flat, and surface drainage is slow, standing water can remain on the surface for months. (These conclusions are based on data collected from 1999 to the date of this report. Comprehensive monitoring data is unavailable for flooding that occurred before 1999, therefore, other environmental conditions might have contributed to flooding in the past and may be a factor in future flooding.)



Salmon Creek Basin has a long and documented history of flooding. Maps dating as early as 1883 show standing water (wetlands) in many locations that still experience flooding today. Anecdotal information, photographs, and past studies also attest to a pattern of flooding in the area.

Although the basin has a long history of flooding, fewer people were affected in the past because land was undeveloped and used for forestry or agriculture. Farmers endured the flooding by digging ditches to lower water levels and lessen the duration of flooding. Most of these ditches were never documented or recorded, and, over time, they became segmented and overgrown as land was subdivided and developed. Other ditches are still in operation, most notably Hopkins Ditch. The Hickman Sub-Area Drainage Improvement Project, completed in 1999, is predicted to reduce the depth of flooding in the area of 93<sup>rd</sup> Avenue and Littlerock Road.

Much of the development in Salmon Creek Basin occurred during a period of low to normal rainfall, between the 1972 and 1996-97 flooding events.

Despite its long history of periodic flooding, Salmon Creek Basin is targeted for growth in planning documents. The 1995 Tumwater-Thurston County Joint Plan designates Urban Growth Area boundaries that stretch deep into Salmon Creek Basin, yet the plan also recognized that some areas are unsuitable for development. The plan directed Thurston County and the City of Tumwater to “determine appropriate methods for stormwater management in advance of development in areas where existing soils may make drainage difficult.” In 2000, Thurston County approved two policies that act upon this directive.

In 2000, Thurston County amended its Critical Areas Ordinance to prohibit development in areas of mapped high groundwater flooding. Also that year, the County approved an “interim” amendment to the 1994 Drainage Design and Erosion Control Manual (DDECM). The

amendment requires developers to ensure that stormwater ponds can function properly, and not increase off-site flooding, even if water tables were to rise again to 1999 levels. At the time this publication went to press, the standards contained in the amendment applied only to properties within Thurston County because the amendment had not yet been approved by the cities of Tumwater, Olympia, and Lacey as part of the broader, jointly approved DDECM.

Zoning designations, approved by both Thurston County and the City of Tumwater in 1996, also suggest that the basin will accommodate a variety of land uses, mainly industrial and low-density residential (4-7 units per acre). In reality, however, the Critical Areas Ordinance and DDECM amendments already affect the density on 72 percent of the basin's undeveloped lands. (See Figure 4-9, Appendix E of the plan.)

Computer modeling found that if the basin were, indeed, allowed to fully develop as planned, any new structures placed in localized depressions could experience flooding. For the four sub-basins that experienced the worst flooding in 1999, a full build-out would increase flooding elevations by less than 18 inches.

Efforts by local residents to alleviate flooding in Salmon Creek Basin have been sporadic and typically gain momentum immediately after past flooding episodes. This cycle has repeated itself four times in the past 50 years. Besides the current effort, citizens requested government assistance to mitigate flooding following the winters of 1954/55, 1966/67, and 1971/72. Records suggest that none of these past flood control efforts went beyond the study phase due to failure to obtain funding, waning local interest, and the basin's natural drainage limitations.

The heavy levels of rainfall that caused flooding in 1999 will occur again. On average, flooding occurs in Salmon Creek Basin every 20 years. The flooding in 1999 was the worst flooding observed in fifty years, based on records. It is also possible that, in the future, Salmon Creek Basin will experience even worse flooding than the recorded levels of 1999.

## **RECOMMENDATIONS**

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### **Alternatives modeled**

Four "nonconveyance" alternatives (i.e. alternatives not involving engineered pipes and ditches for lowering flood levels) were evaluated. These included: installing a sewer system, increasing tree cover in the basin, elevating roads, and buying-out/floodproofing properties.

It was found that installing a sewer system, and/or increasing tree cover in the basin, would not discernibly reduce groundwater elevations under very wet conditions. The alternative of elevating roads also would not affect water levels; however, it would allow access on critical roads during flood periods. Elevating or acquiring properties is the most certain means of alleviating flooding impacts on existing developed properties.

Six "conveyance" alternatives (engineering approaches, involving pipes and ditches) were also evaluated. While these conveyance alternatives would lessen hardships caused by flooding, they

would not alleviate flooding altogether. Computer modeling found that each option would, to varying degrees, delay the onset of flooding, reduce the duration of flooding, and lower the depth of flooding within the project's vicinity. However, none of these alternatives would lower water levels far enough to protect wells and septic systems from flooding, or fully eliminate floodwaters on the surface of the land, given the 1999 flooding conditions.

Of the conveyance options that were modeled, one was found by the committee to be most feasible for the west basin (west of I-5): the option of conveying water from the Rhondo Pond area to Fishtrap Creek. Like all conveyance options, this approach would trigger a full range of regulatory processes required by state and federal agencies.

For the east basin (east of I-5), the study revealed that the modeled conveyance option would be very expensive and benefit too few homeowners. Much of the area that would benefit from the option is undeveloped. Therefore, the committee decided it would be more beneficial for Thurston County to pursue funding sources to flood-proof or purchase homes in high groundwater areas.

The topographical information used for the computer model has a margin of error of + 1 or -1 foot. In the relatively flat Salmon Creek Basin, two feet can mean the difference between flooding or not flooding on any given property. Thus, the computer model provides approximations suitable for general planning purposes, but may not predict the effect an alternative would have on a specific site.

## **Recommendations**

### **For existing development....**

- ❑ *Thurston County should incorporate the Rhondo Pond to Fishtrap Creek Alternative into the Storm and Surface Water Utility's long term (20-year) Capital Facilities Plan, which annually determines project priorities based on uniformly applied criteria. Project implementation is based on project ranking, securing required permits, and available funding. The Stakeholders Committee recognizes there is insufficient funding in the Storm and Surface Water Utility's capital facility plan for this project, and encourages Thurston County to look for alternative sources of funding. (It is important to note that while the Rhondo Pond to Fishtrap Creek alternative would help alleviate the magnitude of flooding in areas of the west basin, flooding would still occur in the west basin.)*
- ❑ *Thurston County should not pursue a conveyance project for the east basin at this time due to the estimated costs, and benefits afforded, based on the results of this study. Instead, the County should seek funding sources to flood-proof or purchase homes in high groundwater areas.*

- ❑ *Thurston County should elevate critical public roads that have historically flooded and develop criteria to prioritize the scheduling of projects.* Critical County roads identified by the County Roads and Transportation Department include:

Little Rock Road and 88<sup>th</sup>.

93<sup>rd</sup> Avenue, west of Jones Road and east of Little Rock Road.

93<sup>rd</sup> Avenue, west of I-5 and east of Blomberg Street.

Tilley Road (SR 121) over the Hopkins Ditch Extension (Thurston County would work with WSDOT to achieve this project.)

Case Road between 86<sup>th</sup> Avenue and 93<sup>rd</sup> Avenue (The Port of Olympia has already scheduled work on this project.)

The Stakeholders Committee also recommends that the following area be considered a critical road: the vicinity around the intersection of 83<sup>rd</sup> Avenue and Rhondo Street and 85<sup>th</sup> Avenue.

*As a secondary priority, Thurston County and the City of Tumwater should pursue elevating the remaining roads that have historically flooded (as shown on Figure 5-1 in the basin plan).*

- ❑ *Thurston County should seek to acquire an easement for the Hickman Sub-area Drainage Improvement Project and maintain the project in perpetuity.* The Hickman project was built as an interim measure in 1999. At the time, Thurston County secured a temporary easement from private property owners so the County could access remnants of the old "Hickman Ditch." The easement is set to expire in June 2004. Thurston County should negotiate with property owners to acquire a permanent easement so the County can have ongoing access for maintaining the drainage improvement project.
- ❑ *The Hopkins Ditch District should continue to maintain Hopkins Ditch and assess corresponding rates. The district should assess current service levels and rates, and develop strategies to increase maintenance activities.*
- ❑ *Thurston County should encourage the Federal Emergency Management Agency (FEMA) to update its Flood Insurance Rate Map to include all of the Salmon Creek Basin's groundwater-flooding areas as special flood hazard areas.*
- ❑ *Thurston County should seek grants, loans and other financial assistance to flood-proof, elevate, or in the most severe cases, acquire homes in high groundwater hazard areas.*
- ❑ *Thurston County should continue to monitor groundwater levels and provide early warning to residents and businesses when groundwater flooding appears imminent.*
- ❑ *Thurston County should incorporate the Salmon Creek Emergency Preparedness and Response Plan as an appendix to the Office of Emergency Management's Comprehensive Emergency Management Plan and update as necessary.*

- *Thurston County should collect, record, and process flood damage data in high groundwater hazard areas.*

**For future development...**

- *The City of Tumwater and Thurston County should re-evaluate the feasibility of supporting urban-level development in areas subject to high groundwater, and revise the 1995 Tumwater-Thurston County Joint Plan accordingly. The plan establishes the boundaries for future growth by the City of Tumwater (Urban Growth Boundaries) and assigns land-use designations such as commercial, light industrial, or multi-family.*
- *When performing its annual re-assessment of property values, the Thurston County Assessors Office should make adjustments that reflect all restrictions to properties in Salmon Creek Basin that might limit development. Thurston County should inform property owners of opportunities to reduce property taxes by considering options such as the Open Space Program or conservation easements.*
- *Thurston County should continue to enforce protection standards in the Thurston County Critical Areas Ordinance for high groundwater hazard and high groundwater buffer areas. The City of Tumwater should maintain or adopt regulations that are equivalent to Thurston County's ordinance. The County Critical Areas Ordinance governs how land is developed in high-groundwater and other sensitive areas. Under the ordinance, building permits will not be issued within areas mapped as high-flooding areas. Proposed projects within 300 feet of mapped groundwater-flooded areas must be set back from the flooded area and elevated. The ordinance also limits timber harvesting, and the percentage of impervious surface allowed on projects near high-groundwater areas.*
- *Thurston County should continue to enforce Flood Plain Building Standards. County standards control filling, tree cutting, grading and other development activities that may increase flood damage. The standards apply to the flood plain along Salmon Creek and Hopkins Ditch, and for high-groundwater areas.*
- *Thurston County should permanently adopt stormwater standards for new development and redevelopment that are technically equivalent to the Revised Interim Stormwater Design Standards for New Development in Salmon Creek Basin. The City of Tumwater should consider adopting equivalent standards.*
- *Thurston County should adopt standards requiring that owners of new wells in flooding areas install well casings that extend above the anticipated flood elevation.*

