

Introduction

This report describes activities performed by Snohomish County in the year 2001 to meet the requirements of the County's Stormwater Management Program, developed as a requirement of the County's National Pollutant Discharge Elimination System (NPDES) municipal storm sewer discharge permit.

S7B1 Stormwater Management Program Planning Process

Stormwater Management Program for 1997 - 2001

The County's Stormwater Management Program (SWMP) describing activities for the years 1997 - 2001 was approved by Ecology in a letter dated July 16, 1997.

Stormwater Management Program for 2000 - 2005

In September 1999, an assessment of the Stormwater Management Program was submitted to Ecology. Following the issuance of the next NPDES permit, a new Stormwater Management Program will be developed in accordance with the requirements of that permit.

S7B2 Water Quality Problems, Needs, and Priorities

Analysis of needs and priorities

In this report, Snohomish County is not proposing any changes to the priorities and needs identified in the approved Stormwater Management Program.

S7B3 Legal Authority

Adoption and enforcement of ordinance containing standards equivalent to the minimum requirements of Ecology's Stormwater Management Manual

On August 3, 1998, the Snohomish County Council adopted by ordinance development regulations that were deemed by Ecology to constitute the functional equivalent of the minimum standards from Ecology's 1992 Stormwater Management Manual. These regulations became effective on September 19, 1998, and remain in effect today.

On November 6, 2001, the voters of Snohomish County approved through the initiative process an ordinance known as the Farming Preservation Ordinance (FPO), which was adopted by the Snohomish County Council into code in late 2001. Although the FPO exempts certain agricultural activities from the requirements of grading and drainage permits in certain circumstances, the exemption is believed to be equivalent to or narrower than the exemption for commercial agriculture set forth in the Department of Ecology's 1992 Stormwater Management Manual.

Copies of the Farming Protection Ordinance, and the Right to Farm Ordinance referenced therein, are attached to this report.

Adoption and enforcement of ordinance prohibiting pollution discharges to the County's municipal storm sewer

In March 1998, Snohomish County adopted Title 7.53 SCC (Water Pollution Control) that prohibited pollution discharges to the County's storm sewer and to surface and ground waters within the County. The code lapsed on March 11, 2001, due to the sunset clause contained in the enabling ordinance. Ecology was notified of this issue. The County immediately took steps to introduce a new ordinance readopting Title 7.53 SCC, and on May 23, 2001, it was passed by the Council. Title 7.53 SCC was readopted with some minor changes that clarified procedural responsibilities of the departments of Public Works and Planning and Development Services. A copy of the ordinance enabling the revised code is attached to this report.

S7B4 Monitoring

SURFACE WATER MANAGEMENT (SWM)

SWM staff performed a number of monitoring activities during the reporting period. The information gained is used to guide a number of County activities including a basis for developing the County's response to listing of species under the Federal Endangered Species Act.

Rainfall and stream-flow gauging

Rainfall and stream-flow gauging were collected at 35 sites during the reporting period. 6 of the sites are co-located with the long-term chemical monitoring sites. Data from all sites was processed and stored in a database with a web browser based user application for use by county staff and others. The data can be accessed www.co.snohomish.wa.us/publicwk/swm/spw_swhydro.

2001 Gaging Program Activity			
	New	Upgrades	Total in Operation
Rain Gages*	1	1	6
Stream Gages	5	4	29

*includes volunteer operated rain gages SWM has supplied.

Long-term physical\chemical monitoring in streams and rivers

During the reporting period, SWM conducted long-term monitoring as described in the permit on 25 sites (Table 1). Water samples at sites were analyzed for the parameters listed in Table 2.

Data from long-term monitoring were used to develop the September 2000 report: The State of the Waters: Water Quality in Snohomish County's Rivers, Streams and Lakes, 2000 Assessment. Violations of water quality standards were found at all long-term monitoring sites. The data are used to estimate relative loads and concentrations of pollutants in County rivers and streams. This information can be used to focus assessment studies in watersheds with particular problems or to target management activities.

Table 1 - Long-term Water Quality Monitoring Sites

Site	Location	Reason for Selection
<i>Stillaguamish Watershed</i>		
CCPK	Church Creek at Church Creek Park	Major tributary to Stillaguamish, evaluates runoff to storm sewers from rapidly developing urban area
FISH	Mouth of Fish Creek	Major tributary to Portage Creek with rural residential and hobby farm runoff to storm sewers
PILC	Mouth of Pilchuck Creek	Largest tributary to lower Stillaguamish with runoff from forestry activities, rural residential, and farms
PORU	Upper Portage Creek at Bridge 311	Major tributary to Stillaguamish with runoff from rapidly developing area to storm sewers
PORL	Lower Portage Creek at Br. 92	Rural basin with agricultural runoff to storm sewers
TR30	Tributary 30 at Silvana Terrace Rd	Rural basin with runoff from commercial and hobby farms to storm sewers
MSAR	Mainstem Stillaguamish at Highway 9 at Arlington	Evaluates runoff from developing rural and residential areas to storm sewers
MSMD	Mainstem Stillaguamish at mouth	Evaluates cumulative effects of runoff to storm sewers
<i>Snohomish Watershed</i>		
QCLD	Quilceda Creek at 88th St NE	Evaluates cumulative runoff from agricultural and developing residential areas to storm sewers
ACLU	Allen Creek at 67th Ave NE	Rural basin with agricultural runoff
ACLD	Allen Creek at 3rd St	Evaluates runoff from rapidly developing residential areas to storm sewers
WCMF	Woods Creek main fork on Yaeger Rd	Major tributary to the Skykomish River with runoff from rural and hobby farm areas to storm sewers
WCWF	Woods Creek west fork on Yaeger Rd	Evaluates runoff to storm sewers from rural areas with moderate development
CATH	Catherine Creek	Evaluate contribution of Lake Stevens watershed to the Pilchuck River
LPIL	Little Pilchuck Creek -12th St NE	Evaluate contribution of Little Pilchuck to Pilchuck R.

Snohomish County, Washington
 NPDES Municipal Stormwater Discharge Permit
 2001 Annual Report

Site	Location	Reason for Selection
DUBQ	Dubuque Creek on OK Mill Road	Evaluate contribution of Dubuque and Panther Creeks to Pilchuck River
PILR	Pilchuck River at 6th St in Snohomish	Downstream site on the Pilchuck River mainstem
FCLU	French Creek on 167th Ave	Evaluates rural and hobby farms runoff
FCLD	French Creek on Old Snohomish-Monroe Hwy	Evaluates commercial agriculture runoff
<i>Cedar/Green Watershed and Tributaries to Puget Sound</i>		
NCLU	North Creek at McCollum Park	Evaluates runoff to storm sewers from residential areas and hobby farms
NCLD	North Creek at Snohomish/King County line	Evaluates commercial, industrial, and high-density residential runoff
SCLU	Swamp Creek at 148th	Evaluates commercial and residential runoff
SCLD	Swamp Creek at Snohomish/King County line	Evaluates commercial, industrial, and high-density residential runoff
LBLU	Little Bear Creek at 180th	Evaluates residential and hobby farm runoff
LBLD	Little Bear Creek at 228th St	Evaluates rural and commercial runoff

Table 2-Long Term Water Quality Assessment Parameters

Parameter	Reason for selection
Temperature	Fluctuations and ranges can affect aquatic species
Dissolved Oxygen	Indicator of ability to support aquatic species
pH	Range influences health of aquatic species, influences toxicity of metals
Conductivity	Indication of contaminants from road runoff, influences toxicity of metals
Stream height	Used in calculating stream discharge
Flow	Influences habitat and erosion, used in calculating discharge
Turbidity	Affects feeding and spawning of aquatic species, indicates erosion problems
Suspended Solids	Affects feeding and spawning of aquatic species, indicates erosion problems
Fecal Coliform	Indicates human or animal waste
Nitrate-nitrite	Indicates human or animal waste, contributes to algal blooms
Total phosphorus	Indicates human or animal waste or fertilizers, contributes to algal blooms
Copper	Indicates road runoff or runoff from commercial activities
Lead	Indicates road runoff or runoff from commercial activities
Zinc	Indicates road runoff or runoff from commercial activities

SWM began long-term monitoring in the South County in 1992, in the Snohomish basin in 1993, and in the Stillaguamish basin in 1994. In 1999 a

one-way analysis of variance was used to compare seasonal means. A general linear model was used for analysis of variance to compare individual water quality parameters by year and season. With seven to nine years of data available, the following parameters showed statistically significant trends over time:

- The mainstem Stillaguamish shows a significant decrease in bacteria and an increase in dissolved oxygen.
- In Glade Bekken of the Stillaguamish, bacteria concentrations decreased significantly. These decreases may be a result of numerous small farm best management practices that have been implemented in that watershed.
- The sites in the Stillaguamish watershed show an increase in conductivity. This increase may be a result of increased population and resulting road runoff.
- Sites in urban areas of the Snohomish and South County watersheds show a decrease in lead concentrations. This decrease may be a result of reduced ambient lead levels as unleaded fuels are more widely used.

Uses of the data during this reporting period included:

- providing background data for a citizen volunteer monitoring program in the Quilceda/Allen watershed under a Centennial Clean Water grant,
- providing data to Ecology for prioritizing water quality problems in the Stillaguamish watershed for water cleanup plans as part of establishing total maximum daily loads,
- developing a database of all water quality, benthic invertebrate, and temperature logger data which is accessible on the Web,
- working with Ecology to develop a cleanup plan for the Snohomish River tributaries, and
- providing discharge and staff data to SWM engineers for design of fish passage culverts and lake level studies.

During this reporting period, the monitoring program staff coordinated with other permittees, municipalities, and tribes. The coordination included the following:

- working with King County, Pierce County, the City of Bellevue, and the University of Washington to develop protocols for invertebrate sampling and habitat assessment,
- continuing an inter-local agreement with the City of Bothell for monitoring in North Creek and maintaining a flow gauge,
- cooperating with Ecology on a metals study in Quilceda and Allen Creeks,
- assisting the City of Marysville to develop a monitoring program,
- coordinating a sampling program with the City of Woodinville for monitoring in Little Bear Creek,
- assisting Ecology in TMDL studies in the Stillaguamish

- coordinating sampling with the Stillaguamish Tribe in the Stillaguamish watershed and sharing data with the, and
- participating in annual regional temperature surveys of Puget Sound lowland streams coordinated by the University of Washington.

Short-term physical/chemical monitoring in streams and rivers

Little Bear Creek

Beginning in April 2000 SWM added four sites in the Little Bear Creek watershed to the two long-term sites already being monitored. The new sites are listed in Table 4. The site locations were chosen to divide the watershed into sub-basins by sampling major tributaries and sections of the mainstem. The data will be used as part of a watershed assessment to estimate pollutant concentrations and loads by sub-basin.

Data through 2002 show the highest bacteria levels in the upper mainstem with significant increases over the last two years. The geometric mean in the mainstem headwaters was 700 colonies/100 ml, decreasing to 200 col/100 ml in the lower mainstem in the City of Woodinville. Mean bacteria levels in the tributaries ranged from 30 to 85 col/100 ml. Concentrations of total copper, total lead, and total zinc in Little Bear Creek exceed the standards for dissolved concentrations of these metals, but based on the typical dissolved fraction of these metals we think that in many cases standards were not violated. The concentrations of metals are highest in the lower, more urban and commercial areas of the creek.

QuilCeda/Allen Creeks

QuilCeda/Allen Citizen Action Team accomplished the following activities in 2001:

- Riparian restoration projects completed at 3 different sites, donating 1000 volunteer hours to these projects. Just over 175 individuals assisted with project implementation.
- Volunteers also sampled fecal coliforms monthly at five separate sites.
- Volunteers operated and maintained four rain gages, downloading and forwarding data to SWM monthly.
- Volunteers have collected and measured stream flow data at five different
- Collectively, these volunteers have contributed over 300 hours of service in these elements.

Table 4 – Little Bear Creek Water Quality Monitoring Sites

Site	Location
LBHW	Little Bear Headwaters on Interurban, just east of 51st Ave SE
TROT	Trout Stream on Interurban, just east of LBHW at stables
DANE	Great Dane Creek on Maltby, just east of Little Bear Creek Road
CUTT	Cutthroat Creek, Hwy 9 south of Maltby Road, sample from private driveway with two mailboxes (21802 and 21806) on west side of road

Benthic invertebrate monitoring

The permit states that SWM will conduct benthic invertebrate monitoring in Glade Bekken in 1997 and 1998 and in French Creek 1997 and 1999. In Glade Bekken, the monitoring plan was expanded to include evaluation of agricultural best management practices as well as measuring reference site conditions in the watershed. In 1997, SWM conducted a county-wide survey of 19 sites, which included the French Creek sites. A second county-wide survey including the agricultural sites was conducted during the fall of 1999. Monitoring in 2000 included the agricultural sites and the short-term sites in the Little Bear Creek watershed. Monitoring in 2001 included 5 agricultural BMP sites and 2 control sites. We also monitored and addition 22 sites in the Stillaguamish watershed, of which 6 sites were part of a comparison study with Ecology’s TMDL study.

Protocols for invertebrate monitoring followed those established by Ecology with modifications for use with James Karr’s Index of Biological Integrity (IBI), similar to the protocols used by King County. SWM sampled riffles, taking three uncomposited, replicate samples at each site. We analyzed the data using the IBI for benthic invertebrates for Puget Sound lowland streams to determine the level of impact from human activities, which combines ten measures of individual and population attributes into a score. The scores range from a low of 10 to a high of 50. Results of the monitoring are listed in Table 5. The IBI scores give us information that can be added to the data from the chemical monitoring to give us a more comprehensive understanding of impacts from increasing development and stormwater runoff.

Invertebrate monitoring was done in the Cemetery Creek watershed to support citizen water quality monitoring and watershed restoration activities there.

Snohomish County, Washington
 NPDES Municipal Stormwater Discharge Permit
 2001 Annual Report

Table 5. Benthic invertebrate survey sites and locations.

Benthic Invertebrate survey	1997 B-IBI	1998 B-IBI	1999 B-IBI	2000 B-IBI	2001 B-IBI	Site location
<i>Stillaguamish Watershed</i>						
Fish Creek	30		28		32	WQ site fish
Fish Creek					30	11 th Ave NE
Pilchuck Creek	24		28			WQ site pilchuck
Pilchuck Creek					24	Hwy 9
Pilchuck Creek					22	I 5
Pilchuck Creek					26	Stanwood-Bryant Rd
Church Creek					34	Woodland Rd
Church Creek					36	Twin City Elementery
Church Creek					32	Pioneer Hwy
Church Creek					30	Jensen Rd – Bridge 569
Church Creek					24	284 th St. East
Church Creek	28		28			WQ site cckpk
Secret Creek					34	5 th Ave off Dahl Rd
Riley Creek	30				36	Upstream of Jim Ck Rd
Armstrong Ck.					24	Stilly hatchery
Bear Creek					26	208 th St
Canyon Creek					24	124 th St
Jim Creek					24	Mouth at Jordan Rd
Jim Creek					28	Navy Base
Jim Creek					26	Whites Rd, Bridge 596
Kruger Ck					30	207 th St NE and Burn Rd
Portage Creek					24	206 th St NE and 61st
Portage Creek					34	80 th Ave NE
Prairie Creek					30	74 th Ave NE
<i>Snohomish Watershed</i>						
Wallace River			30			
May Creek			42			
Cemetery Creek (Snohomish trib)				28		Steward project, 85 TH , S of 72 ND on mainstem
French Creek gage	38		36			WQ site fclu
French Ck. upper mainstem, Meadowlake Rd.			34			S of 84 th St SE
French Ck. mid mainstem, Trombley			38			Downstream of horse crossing

Snohomish County, Washington
 NPDES Municipal Stormwater Discharge Permit
 2001 Annual Report

Benthic Invertebrate survey	1997 B-IBI	1998 B-IBI	1999 B-IBI	2000 B-IBI	2001 B-IBI	Site location
<i>Snohomish Watershed Continued</i>						
French Ck, lower mainstem, 159th			30			Mainstem – 159 th
Cripple Creek	32		32			Upstream of 179th
Spada Ck			40			Trombley and Spada
Golf Course Ck			36			Downstream of Westwick Rd
Chain Lake Creek			18			Trombley and Chain L Rd
Upper Woods Creek			26			Off Woods Ck Rd
Woods – Lake Rosiger			36			Outlet from L Roesiger, above confluence w Woods
Woods Ck – Pipeline Rd			22			E of 21 st Ave SE
Woods Ck – Bridge 298			34			Bridge 298, S of powerline
Woods Creek mainstem	34		28			WQ site wcms
Woods Creek west fork	26		34			WQ site wcfw
Woods Creek lower mainstem	24					Buck Island Park
Carpenter Ck downstream			38			Creswell Rd
Carpenter Ck – upstream			34			Sanders Rd
Friar Ck			34			Upstream of 104 th ST SE
Pilchuck R mouth	24					Snohomish City Park, S of 92 nd St SE
Pilchuck R – 28 th Pl. NE	24					28 Pl NE, off Russell Rd
Pilchuck R – Snohomish Bridge 304			20			WQ site pilc
Little Pilchuck Creek			34			WQ site lpil
Catherine Creek			26			WQ site cath

Snohomish County, Washington
 NPDES Municipal Stormwater Discharge Permit
 2001 Annual Report

Benthic Invertebrate survey	1997 B-IBI	1998 B-IBI	1999 B-IBI	2000 B-IBI	2001 B-IBI	Site location
<i>Snohomish Watershed Continued</i>						
Dubuque ck Creek			32			WQ site dubq
Panther Creek	26		30			Upstream of 16 th St SE
Bunk Foss			14			Downstream of culvert on Machias Rd
Sexton Creek			26			Upstream of 131 st Ave SE
Munson Creek	16		24			Grove St past 69 th
Quilceda middle fork	30		30			Wade Rd, Centennial Trail
<i>South County Watershed</i>						
Norma Creek	20		18			WQ site psld
North Creek gage	18		16			WQ site ncl, UW site
Swamp Creek gage	22		20			WQ site scl
Little Bear upstream	34		34	30		WQ site lblu, UW site
Little Bear downstream	30		28	30		WQ site lbl, UW site
Little Bear headwaters				34		WQ site lbhw
Trout Stream				34		WQ site trot
Great Dane Creek				34		WQ site dane
Cutthroat Creek				34		WQ site cutt
Little Bear near mouth				28		Woodinville site lwcc
<i>Project evaluation – ag BMPs</i>						
Trib 30 – 220 th (Stillaguamish trib)	32	32	32	32	34	Reference site
Trib 30 – Silvana Terrace	28	30	36	32	32	Reference site, WQ site tr30
Trib 30 – mouth	26 pre	28 pre	34 post	30 post	24	Headrick project evaluation, WQ site t30a,
Trib 30 – channel			22 post	20 post		Constructed channel, middle of Headrick project
Trib 33	20 pre	22 pre	18 post	16 post	18	Tatum project evaluation, WQ site t33

Benthic Invertebrate survey	1997 B-IBI	1998 B-IBI	1999 B-IBI	2000 B-IBI	2001 B-IBI	Site location
<i>Project evaluation – ag BMPs Continued</i>						
Trib 31	22 pre	28 post	26 post	28 post	18	Neff project evaluation, WQ site t31
Oso fencing project (Stillaguamish trib)		24 pre	26 during	28 post	34	BMP evaluation, SCD project, 179 th St off Hwy 530
Stables Creek project (French Creek)			28 pre	38 post	38	BMP evaluation, 96 th St SE

Cemetery Creek

Beginning in April 2001, four citizens from the Cemetery Creek watershed began monthly monitoring of nine watershed sites. Volunteers were trained by SWM water quality staff. The sites sample the major tributaries in the watershed. The citizens use Hach kits to test DO and pH; turbidity and temperature are also measured. County water quality staff conduct quality control by sampling all the sites quarterly, adding conductivity to the sampling parameters. A map of the sites and the results of the monitoring are on the following web site:
<http://www.co.snohomish.wa.us/publicwk/swm/steward/index.htm>.

The monitoring results thus far have identified low DO and turbidity as problems. Major turbidity problems were traced to specific unpermitted activities and were corrected. The low DO in one stream reach has been traced to a specific area, and has been referred to the Ecology to address. Previous water quality monitoring has been done in the watershed identifying fecal coliform bacteria as a problem. Small farms and stables along the Cemetery Creek and its tributaries have been referred to the Snohomish Conservation District.

Physical/chemical monitoring of lakes

Routine Monitoring

During the summer of 2001, SWM staff and citizen volunteers monitored 25 priority public access lakes four times during the growing season--once each month in June, July, August, and September. The lakes were Armstrong, Blackman, Bosworth, Cassidy, Chain, Cochran, Crabapple, Echo, Flowing, Goodwin, Howard, Ketchum, Ki, Loma, Lost, Martha (N.), Martha (S.), Panther, Riley, Serene, Shoecraft, Stickney, Storm, Sunday, and Wagner. In addition,

SWM staff monitored Rowland and Ruggs lakes at least once during 2001. Drainage Improvement District #8 of Lake Stevens also monitored Lake Stevens bi-weekly and Lake Cassidy once during this period.

During each monthly sampling period, SWM staff monitored 9 of the priority lakes (Bosworth, Cassidy, Chain, Echo, Flowing, Lost, Martha (N.), Panther, and Wagner) at one meter intervals throughout the water column for temperature, dissolved oxygen, pH, and conductivity using a Hydrolab Datasonde. Staff collected samples from the epilimnion and the hypolimnion of each lake for lab analysis of total phosphorus concentrations. Secchi depth measurements and qualitative observations of algae and zooplankton abundance were also made for each lake.

Selected citizen volunteers monitored the remaining 16 priority lakes during the same one week periods each month. The volunteers collected dissolved oxygen and temperature profile data throughout the water column using LaMotte kits and modified vertical water samplers. The volunteers also collected epilimnion and hypolimnion total phosphorus samples, and made Secchi depth measurements and qualitative observations of algae and zooplankton abundance, in the same manner as done at the staff-monitored lakes.

Sampling during 2001 was conducted at the deepest point in each lake because that is the location where the water quality parameters are most representative of the overall lake conditions. Monthly monitoring from the June through September period provides a representative picture of lake health during the growing season. The warm months of the growing season represent the period when the lakes are most likely to exhibit problems with excess algae or aquatic plants that interfere with use of the lakes. Inputs of nutrients from stormwater and other nonpoint sources during the year can also be reflected in the summertime lake productivity. Monthly monitoring from June through September also satisfies the guideline of four sampling events for establishing lake nutrient standards in accordance with the state water quality regulations (WAC 173-201A). The average from four epilimnion total phosphorus samples also provides a basis for determining the trophic status of each lake. Combined with the summer average Secchi depths recorded by citizen volunteers and SWM staff, the total phosphorus averages give a more comprehensive view of lake conditions.

Basic Volunteer Monitoring

During 2001, SWM staff supported citizen volunteers at 23 lakes in Snohomish County. These lakes were: Armstrong, Blackman, Cochran, Crabapple, Goodwin, Howard, Kayak, Ketchum, Ki, Loma, Lost, Martha (S.), Nina, Riley, Rowland, Ruggs, Serene, Shoecraft, Spring, Stickney, Storm, Sunday, and

Wagner. In addition, Washington State Department of Ecology lake assessment staff supported similar volunteers at Bosworth, Martha (N.), and Roesiger.

Basic volunteer monitoring includes measurements of Secchi depths, surface temperatures, and lake levels, as well as observations about lake color and shoreline/watershed conditions. Volunteers are asked to monitor every two weeks from May through October to cover the entire growing season. The amount of data received from individual volunteers in 2001 varied from two observations to almost twenty. In addition, as described above, volunteers at 16 lakes measured dissolved oxygen and temperature profiles within the water columns approximately once per month using LaMotte kits and sampling bottles, as well as collected total phosphorus samples.

The volunteer monitoring program is an important element of physical/chemical lake monitoring because the data are combined with SWM staff monitoring to better assess lake conditions and the potential impacts of nonpoint pollution. All of the 25 priority lakes receive runoff from County roads and from residential properties. Regular and on-going monitoring is the primary means of assessing the impacts of such nonpoint pollution.

Data Analysis and Reporting

SWM staff managed and analyzed lake quality data using an Access database. Monitoring results were provided to volunteers, the general public, and other agencies as requested. During 2001, SWM staff worked to complete a report of all the lake monitoring data collected in recent years. This overall report will be published in 2002. In addition, SWM worked with an outside consultant to create an Internet-accessible database that will provide public access to all lake monitoring data. This database application will be online in 2002.

Public Education Conducted as Part of the Lake Monitoring Program

SWM staff conducted a training workshop for all the citizen volunteers in May 2001. Staff trained the volunteers to correctly perform lake monitoring and provided information about evaluating lake data, working with neighbors, being a watchdog for their lakes, and using BMPs to protect water quality around their homes. Also during the year, SWM staff took advantage of opportunities for one-on-one public education on a regular basis when they encountered citizens while in the field for lake monitoring and when citizens called with questions about lakes.

Groundwater chemistry monitoring

The Program does not require groundwater monitoring, and none was performed by SWM during the reporting period.

Compost stormwater filter evaluation

Completed In January 1999.

Catch basin and catch basin insert evaluation

Completed in March 1998.

Construction site BMP monitoring

Completed in 1999.

Storm sewer monitoring in commercial and industrial areas

Storm sewer monitoring in commercial and industrial areas was conducted in upper Swamp Creek as part of SWM's Swamp Creek Illicit Discharge Remediation Grant through the first 6 months of 2001. Water quality samples were collected in the commercial and industrial area of lower Little Bear Creek beginning in 2001 for determination of the water quality variability of the runoff. This data will be used to develop the monitoring plan for this area. Monitoring in this will begin in 2002.

S7B5 Fiscal Analysis

The budgets developed for this section were assigned in 5 yearly increments for the permit period 1995-2000. There are no budgets assigned to the year 2001. The programs developed under the original permit continue to perform the required activities as described in the other sections of this report.

S7B6 Data Management

PLANNING AND DEVELOPMENT SERVICES (PDS)

Maintenance of maps depicting existing land use.

1. PDS has been continuing to map and update land uses in unincorporated urban growth areas. Maps have been completed for the following cities.

Snohomish, Mill Creek, Gold Bar, Lake Stevens, Marysville and Arlington as well as Index and Monroe. These maps are in digital format.

2. PDS has continued working with the Tulalip Tribes and has developed a map identified as Snohomish County trust lands, which also identifies the Tulalip Tribes trust lands.
3. PDS has mapped open space / greenbelt and commercial agriculture areas for the county in digital format.
4. PDS has mapped lands useful for public purposes, these maps are being updated to incorporate additional utility corridors, parks, public trails, major sewerage and infrastructure and treatment facilities as well as a north county coordinated water system plan.
5. The engineering staff within PDS now utilizes GIS during plan review to assist in their assessment of site plans and development proposals.
6. Annexation maps are being continually updated to assist in the transition to infill UGA Boundaries and determine the extent rural areas are being developed.
7. The PDS Erosion Control Grant report was submitted and finalized in 2001 as well as presentation of the results of the Quilceda/Allen studies at a national conference on low impact development in June which the county helped sponsor.
8. During 2001 PDS expanded our capability in mapping and data management.
9. GIS staff improved utility mapping of sewer basins, fire station locations and key pipeline infrastructure. Other special projects to develop a draft critical aquifer recharge map and a draft mineral lands inventory map for public meeting are underway.

Development of zoning maps

PDS has zoning maps available for purchase at the 5th floor counter as a GIS product for most of the county and continues to update the maps via the cartographic group. The official zoning maps are kept at the front counter for public review to assist the public.

PDS is updating zoning information as rezones occur. Data on plats and short plats are added into a development layer. PDS developed a partial landslide and full erosion hazard layer in the GIS database during 1997 and has updated this information as geotechnical reports describe these topics. PDS coordinated with University of Washington in their contract to research all available soils reports in the SWUGA to assist in the Brightwater Treatment Plant EIS and to properly characterize geologic conditions.

The resource planning group continued it's efforts and outreach in the areas of the mineral lands plans and alternatives maps development of a draft aquifer

recharge ordinance and maps tied to potential potable groundwater protections and critical area regulations upgrades.

AIRPORT

Mapping and assessment of storm sewer

Storm sewer data is available on the Airport autocad system. The Runway Safety Area Project storm system improvements are complete. The new improvements will be integrated into the autocad system.

SURFACE WATER MANAGEMENT (SWM)

Land Cover Information Maps

Existing and future land cover data layers are an integral part of the data pieces used for hydrologic modeling. Snohomish County Planning and Development Services (PDS) develops land use maps for selected portions of urban growth management areas within the County. The land use maps developed by PDS are based on the most current digital orthophotography available for an area and on fieldwork. Snohomish County Surface Water Management (SWM) modifies the land use data created by PDS to obtain a generalized land cover data set. In developing the land cover data, SWM typically assigns an effective impervious rating and a land cover (for example, lawn, forest, pasture) for each of the land use designations mapped by PDS.

SWM is now looking at using new tools, such as remote sensing, to replace or supplement the existing methods for generating land cover information used for modeling.

- **Status** During the 2001 reporting period, SWM GIS hired several GIS staff with remote sensing capabilities. Working with our SWM ESA staff, the SWM GIS staff purchased imaging software and began scanning in existing aerial photos into GIS so that they can be used for riparian change analysis type work. SWM GIS also purchased satellite imagery and will be working with the SWM ESA staff to develop remote sensing capabilities for land cover and vegetative analysis.

Hydrologic Database Development

In 2001, additional improvements to the County's hydrologic data sets were made by DIS and SWM GIS including additional stream routing, correcting labels, and improving data set documentation.

The Department of Information Services GIS Division is responsible for maintenance of the 1:24,000 GIS hydrograph layer used by Surface Water Management and Snohomish County. The correcting of spatial accuracy of streams, adding of new streams, and update of attribute data is an ongoing process. SWM GIS is always striving to improve on the accuracy of the data layer, both in terms of attribute data and positional accuracy of the stream location.

- **Status** During the 2001 reporting period, efforts have been focused on conducting GPS inventory of constructed and natural drainage features within Urban Growth Areas to provide the spatial accuracy for moving and relocating hydrograph. In 2002, SWM GIS will work with Snohomish County Department of Information Services, GIS Division in incorporating changes to the hydrograph layer within the Urban Growth Areas of Snohomish County. Where appropriate, streams will be relocated or new tributaries added based on the detailed GPS inventory currently underway as part of the Drainage Needs Report Project in the Urban Growth Areas of Snohomish County.

Description and Location of Major Structural BMPs and Other Structural Controls

Inclusion of drainage facilities (e.g., detention facilities, catch basins, pipes, swales, ditches, outfalls, etc.) as a data layer on GIS will enhance SWM's response to drainage service requests and SWM's overall understanding of water flow through the constructed and natural drainage systems.

- **Status** SWM is using Global Positioning System equipment to locate and attribute drainage infrastructure (for example, catch basins, pipes, driveway culverts, roadside ditches, swales, detention facilities, illicit discharge locations, etc.). The GIS drainage network generated from the GPS inventory is highly accurate (e.g., 1": 2400") with horizontal and vertical locations within 2 - 5 cm. The high accurate GIS drainage network fits well with the overall County GIS plan to develop a high accuracy data layer based on the integrated land records data set.

During the 2001 reporting period, SWM completed a detailed GPS inventory of approximately 46% of the 72 square miles of unincorporated Snohomish County within the Urban Growth Areas. The remainder of the Urban Growth Area, approximately 38 square miles, will be inventoried in 2002.

Mapping of Storm Sewer Outfalls and Tributary Conveyances

Accurate identification and mapping of stormwater outfalls, incorporation of outfall locations into a GIS infrastructure data layer, and connecting that outfall to

a GIS drainage network is very important to the tracking of pollutants from the natural system up through the constructed drainage system to a source location.

Similarly, the accurate identification and mapping of small feeder tributaries or ephemeral streams and incorporation into a GIS hydrology layer is important to the protection of the natural drainage network.

- **Status** As part of the Drainage Needs Report Project, SWM is conducting an infrastructure inventory of all constructed and natural drainage features within the Urban Growth Areas of Snohomish County. Outfalls are noted in the attribute dictionary and can be mapped as needed within the Urban Growth Areas.

Maintenance of SWM GIS Data Layers and Databases

Maintenance and update of all SWM GIS project data layers and databases are important to all SWM programs, including mandated programs such as NPDES. SWM GIS maintain GIS coverages and data sets (for example, precipitation, stream flow, water quality) that are important for hydrologic and hydraulic modeling purposes and other SWM programs and activities.

- **Status** SWM GIS maintains GIS layers and databases that were developed by SWM for SWM analysis, display, and modeling.

Water quality complaint investigations / Data base development and maintenance

The software for the SWM complaint tracking database was updated in 2001 and an SOP is being developed for new employees to refer to.

Maintenance of SWM GIS Data Layers and Databases

SWM GIS maintain GIS coverages and data sets (for example, precipitation, stream flow, water quality) for hydrologic and hydraulic modeling purposes and other SWM programs and activities. The location of the precipitation, stream flow, and water quality monitoring sites have been placed on GIS. Although the actual data can be attached to the GIS coverage, SWM typically uses other programs (for example, MS Excel, MS Access, and statistical packages) to analyze and manipulate precipitation, stream flow, and water quality data.

SWM completed a February 2001 status report for the Snohomish County Land Cover Project. This report used 1998 LANDSAT multi-spectral imagery and work done by the University of Washington's PRISM (Puget Sound Regional Synthesis Model) project to evaluate land cover in Snohomish County subbasins. This project helps to classify watershed characteristics to assist in salmon

conservation planning and evaluation of aquatic habitat data. A validation of the methods used in the project also was substantially completed in 2001.

S7B7 Intergovernmental Coordination

SURFACE WATER MANAGEMENT (SWM)

General coordination for monitoring, mapping, data management, and modeling

SWM participates in a regional group of scientists working on establishing common protocols for biological monitoring of area streams. SWM also participated as a member of Ecology's Technical Advisory Committee in the development of a new Stormwater Management Manual. During this period, SWM worked with cities and drainage and diking districts to develop interlocal agreements for cooperative surface water management. A long-standing agreement with the city of Bothell was continued, covering cooperative water quality monitoring, stream flow gaging, facility payment, and watershed stewardship activities. Pursuant to an agreement with the City of Lake Stevens and Drainage District 8 to set a framework for long-term service provision and the transition of services in annexed areas, the County continued a cooperative effort with these agencies to develop a level of service agreement. The County and City of Lake Stevens completed an interlocal agreement for operation and management of an aeration system for Lake Stevens.

General coordination for control of stormwater pollution from other jurisdictions

Snohomish County has an interlocal agreement with the City of Bothell for ongoing Surface Water Management Division services. Cost sharing and planning for the construction and operation of the North Creek Regional Stormwater Detention facility, stream-gaging operation, ambient water quality monitoring and watershed stewardship activities within the North Creek basin are included in this agreement. The County operates a rain gage and a stream gage located within the City of Bothell. Continued operation and maintenance of this gage is important to assess stream flow changes and stormwater trends in North Creek. One of the long-term water quality monitoring sites is located within the City of Bothell upstream of the flow gage. Continued operation of this long-term water quality monitoring site is important for tracking long-term water quality trends in the watershed with statistical confidence. Gaging information and water quality results are shared with the City of Bothell.

SWM is a co-director of an interagency group that coordinates water quality programs, monitoring, restoration, and outreach in the Stillaguamish River watershed. SWM has provided GIS services in support of this effort, and GIS information is available to other jurisdictions.

SWM has completed a Memorandum of Understanding with the Washington State Department of Transportation (WSDOT) that allows SWM staff to perform storm sewer investigations in the WSDOT right-of-ways other than I-5, throughout the County. These investigations are described in the SWM portion of Section S7B8g - Illicit Discharge Elimination Program. The MOU is valid through the end of the year 2002.

SWM has entered into a Memorandum of Understanding with King County, under which King County provides Microtox™ analyses for outfall screening and commercial/industrial monitoring samples. The agreement is valid until the end of 2003.

SWM submitted an annual work program and plan to WSDOT for surface water activities related to minimizing and mitigating pollution from state highways, as part of the justification for receiving SWM utility fees from WSDOT. This work includes monitoring, outreach, illicit discharge investigation, and other activities.

In 2001, Snohomish County provided funding in excess of \$260,000 to the Snohomish Conservation District, in exchange for professional services including assisting farmers in implementing agricultural best management practices.

SWM staff participate in an NPDES permittees' group that discusses coordination and implementation issues, including monitoring, investigation, and enforcement. The group meets approximately quarterly.

Development of coordinated SWMPs for waterbodies shared with other municipal permittees

SWM has continued discussions with King County Water and Land Resources Division to discuss coordination on specific SWMP elements, with no firm outcomes yet. Our goal is to make tangible progress in coordinating certain elements for the next SWMP. We expect that the programs most affected would be monitoring, data management, and stormwater planning.

PLANNING AND DEVELOPMENT SERVICES (PDS)

Interjurisdictional Policies on Natural Environment, Parks and Recreation and Open Space:

Implementation has continued to occur incrementally as local jurisdictions within the county prepare, adopt, and update their GMA comprehensive plans in consideration of these policies.

All jurisdictions within the County have agreed via Snohomish County Tomorrow to consider these policies in preparation of their plans, so changes in jurisdictional boundaries will have no effect on their implementation. No incorporation's have occurred since adoption of the policies, primarily city/county boundary changes have occurred as a result of small annexations over the past 2000 and 2001 reporting period.

Everett has annexed several larger areas in the Airport Road/South Everett area and was in a large annexation proposal called Gateway by Lynnwood during 2001, which might impact Swamp Creek regional wetland system.

The following intergovernmental coordination activities of Planning and Development Services were pursued during the past years.

- Review and comment on updates to Growth Management Act (GMA) comprehensive plans of cities in Snohomish County for consistency with interjurisdictional policies pertaining to Land Use, Capital Facilities, Natural Environment, Parks and Recreation and Open Space which relate to surface water impacts.
- Coordinate county review and response to municipal annexation, consolidation and incorporation proposals. Draft and negotiate master annexation interlocal agreements and ongoing individual annexation addendums to those agreements. The agreements address coordination and transition of Public Works, Surface Water Management responsibilities including fees and service responsibilities, maintenance and ownership responsibilities, improvement responsibilities and watershed planning. Many of these are now being handled via the internet and internal web page to get the word out to the public on what is proposed to be annexed.
- Participate in implementation of policies in the Snohomish County GMA Comprehensive Plan - General Policy Plan (GPP) that recommend working with cities in Snohomish County to undertake joint planning, financing and development of regional stormwater detention and flood control projects to mitigate run-off impacts to receiving waters.

- Develop subarea plans for urban growth areas through interlocal agreements for joint planning between the county and cities in Snohomish County to implement policies and directives in the GPP. Urbanization impacts to surface water and drainage are being analyzed and recommendations to control impacts are incorporated into the UGA plans as policies, plan map designations and implementation measures.
- The following on-going GMA Planning projects intended to respond to neighborhood and stakeholder interests are as follows:
 - Clearview subarea planning effort
 - Mill Creek East UGA plan 3 square mile portion of SWUGA
 - Marysville/Lakewood plan
 - Southwest UGA project and potential integration of essential public facilities like the proposed King County DNR Brightwater Sewerage Treatment Plant
- Develop a subarea plan for fee simple lands on the Tulalip Reservation through a joint planning process with the Tulalip Tribes. Reconcile differences between the county and the Tribes' rural and resource land use designations in their respective comprehensive plans. The subarea plan will assist the Tribes' in protecting the central core of the reservation by reducing the density of future rural development, which will reduce adverse drainage impacts to receiving waters.
- Provide oversight to the Snohomish Conservation District through an interlocal agreement for funding of farm management plans and best management practices implementation that will reduce the potential for non-point pollution to receiving waters. Support efforts to reduce pollutants to ESA waters via Farm Plans or approved grading permits or use of best management practices and model farms.

General Policy Plan

The policies of the GPP calling for interjurisdictional planning that addresses surface water quality issues are being implemented as the county and cities incrementally prepare subarea plans for urban growth areas (UGA). Water quality issues have been addressed in UGA plans using methods such as continuation of rural Shoreline Management provisions for an area added to a UGA and the use of "planned zones," requiring development plan approval, along stream and river corridors.

Subarea plans for the Gold Bar, Snohomish, and Mill Creek UGA have been adopted. A subarea plan for the Lake Stevens UGA is in the final deliberation stages and is with the County Council. Subarea plans for the Arlington UGA,

Marysville UGA, and the Penny Creek and Tambark Creek corridor, east of Mill Creek have been finalized. The master plan for the Smokey Point area, addressing Quilceda/Allen watershed issues, will be prepared as a second phase of the UGA subarea planning for Arlington and Marysville. This plan will require further work addressing a sensitive aquifer recharge area and potential measures for protection.

Portions of some UGA that are subject to current or future interjurisdictional planning have been annexed and are no longer under the land use jurisdiction of the county.

Interlocal Agreements for Joint Planning Between the County and its Cities

The interlocal agreements for joint planning between the county and the cities and towns are intended to implement GPP policies as described above under "General Policy Plan." As mentioned above, subarea plans for the Gold Bar, Snohomish, and Mill Creek UGA have been adopted. A subarea plan for the Lake Stevens UGA was finalized in 2001. Final Plans for the Arlington UGA, Marysville UGA, and the Tambark Creek corridor, east of Mill Creek, are still under preparation.

OFM population forecasts/capital facilities update continue to work closely with cities to assist in growth model predictions. PDS put on basic GMA planning courses in concert with DCTED at the City of Lynnwood during 2001.

The buildable lands in all jurisdictions within Snohomish County is being worked on in an attempt to comply with a September 1, 2002 deadline.

Portions of some UGA that are subject to current or future interjurisdictional planning have been annexed and are no longer under the land use jurisdiction of the county.

Interlocal Agreements Concerning Annexation Within Cities' Growth Planning Areas

Snohomish County reached agreement with Monroe on a master annexation interlocal in August 1996. The agreement addresses coordination and transition of Public Works Surface Water Management responsibilities with Monroe within a designated surface water management area. The agreement addresses fees and service responsibilities, maintenance and ownership responsibilities, improvement responsibilities and watershed planning. The agreement notes that implementation of the watershed planning section will require negotiation of a more specific sub-agreement between the County and Monroe. Snohomish County is currently discussing similar master annexation interlocal agreements

with Lake Stevens, Marysville, Stanwood, Arlington and Snohomish. The manner in which these subsequent interlocals are formally negotiated has not been finalized. However, Snohomish County intends to use the county water pollution control ordinance and the state water quality standards as the basis of any agreements. The interlocal agreements are specifically intended to address issues related to annexations, which may include water quality issues.

Memorandum of Understanding with the Snohomish Conservation District:

Consistent with the 1993 Memorandum of Understanding and annual funding agreement between Snohomish County and the Snohomish Conservation District, efforts continued throughout the period to assist farmers in implementing agricultural best management practices that will reduce or eliminate non-point sources of pollution. Negotiations were initiated to renew the Memorandum of Understanding for the 1998-2002 time period.

S7B8a Runoff from new development and redevelopment

**PROSECUTING ATTORNEY / PLANNING AND DEVELOPMENT SERVICES /
SURFACE WATER MANAGEMENT**

Development of ordinance containing minimum technical requirements equivalent to those in Ecology's Stormwater Manual, and development of County stormwater guidance manual equivalent to that of Ecology's Stormwater Manual

On August 3, 1998, the Snohomish County Council adopted ordinance revisions that contain the equivalent of the equivalent of the minimum standards from Ecology's 1992 Stormwater Management Manual. These revisions became effective on September 19, 1998.

The County adopted the remaining portions of the Ecology Stormwater Manual and a County-developed addendum as development guidance in September 1998. Following adoption, the addendum was sent to Ecology for equivalency consideration and a letter was received indicating DOE's position on equivalency.

In November, 2001, a citizen initiative was passed that broadened the scope of agricultural exemptions for grading permits and drainage plans. This is discussed in detail in section S3 of this report.

ROAD MAINTENANCE (RM)

Compliance with construction document and performance requirements of Ecology's Stormwater Manual.

Construction site erosion and sediment control (ESC) measures are implemented during maintenance activities, and on construction sites, to minimize water pollution. ESC techniques are implemented in accordance with the Stormwater Manual, the draft Regional Road Maintenance Endangered Species Act Program Guidelines, County Drainage Manual and Snohomish County Code Titles 17 and 24, or with construction plans, for maintenance and construction projects. Proper implementation of ESC measures is monitored by Supervisors, Leadworkers and other staff who have been trained in ESC techniques and practices.

SURFACE WATER MANAGEMENT (SWM)

Compliance with construction document and performance requirements of Ecology's Stormwater Manual.

The Drainage Rehabilitation and Investigation (DRI) program designs and constructs projects to correct localized drainage problems. All project are designed in accordance with Ecology's Stormwater Manual and are reviewed for compliance with the requirements of the manual

PLANNING AND DEVELOPMENT SERVICES (PDS)

Review of construction documents for compliance with Ecology's Stormwater Manual

Over 90% of all construction documents received either meet the Ecology's Stormwater Manual criteria for storage and release or infiltrate the run-off or are less than 5000 square feet and would be considered exempt due to that minimum threshold size by DOE.

In certain areas Snohomish County has elected to exceed Ecology's minimum standards, for example the winter grading restrictions or limitations are more stringent than the 2-day cover requirement, which is already adopted.

All divisions within PDS which review construction documents for drainage and erosion control are now reviewing grading and drainage activity consistent with Titles 17 and 24 SCC.

On going training is occurring within PDS to stay current with upcoming revisions to the 1992 Manual.

Inspection and enforcement of land use ordinances.

PDS inspects private construction to ensure compliance with approved drainage plans, including proper implementation of erosion and sedimentation control (ESC) measures. Inspections are performed on a regular basis during the course of each construction project. The number of inspections on each project varies by the nature, complexity, and duration of the project. This group reviews new construction, plat roads, right-of-way construction, and utility work. As part of larger projects, review of Stormwater Pollution Prevention Plans or SWPPP has now become an industry standard for those projects larger that create more than 5 acres of exposed earth.

PDS provides annual training in ESC to construction inspectors and code enforcement officers. The DOE Erosion Control Grant assisted in funding this effort in PDS these last two years.

If field inspections show that approved drainage plans are not properly implemented, PDS is authorized under Snohomish County Code Title 28 to take enforcement actions, including: issuing stop-work orders, suspending or revoking permits, and requiring discontinuance of actions which violate codes or standards of performance. Corrective actions are then imposed under a prescribed compliance schedule. Further, the County in general has the authority to assess civil and criminal penalties for code violations.

The County has assigned a high priority to ensure that erosion and sedimentation problems at construction sites do not occur. To this end, PDS will perform all necessary inspection and enforcement in an effective and timely manner.

Currently, PDS allocates 6 FTE's annually to investigate reports of construction activity conducted without proper grading permit or drainage plan approval, and to enforce applicable County land use codes (Title 17-Building, Title 24-Drainage and Chapter 7.53 Water Pollution). This investigation and enforcement will continue in an effective and timely manner during the term of the permit.

During the term of the permit, PDS staff will coordinate work with DPW Surface Water Management and Ecology staff on issues related to construction sites with significant erosion and sedimentation problems.

The history as of 2001 activity:

235 total active files from 1998 – grading/drainage complaints:

- 29 ongoing investigations (open)
- 36 notice & Order (Administrative Enforcement/Appeals)
- 4 sent to Prosecuting Attorney
- 157 closed

9 active drainage complaints:

- 1 ongoing NPDES investigation
- 1 referred to Prosecuting Attorney
- 7 closed

AIRPORT

Compliance with construction document and performance requirements of Ecology's Stormwater Manual.

The following activities were performed:

- Swanson Wetland Project Fall 2001 earthwork has been accomplished with no violations. Some plants to be installed in Spring 2002.

PARKS

Compliance with construction document and performance requirements of Ecology's Stormwater Manual.

All construction documents developed for the Parks during the reporting period conformed to the Ecology Stormwater Management Manual, and all contractors performed in accordance with the Manual.

Most construction by Parks is designed and constructed by private contractors, and is thus reviewed and inspected by Planning and Development services (PDS). (Some small capital projects are designed by consultants, and constructed by Parks maintenance employees. These projects also are reviewed/inspected by PDS.)

ENGINEERING SERVICES (ES)

Compliance with construction document and performance requirements of Ecology's Stormwater Manual.

ES designs and constructs projects for several County agencies. During this period of the permit, ES has ensured that drainage design and erosion / sedimentation control measures incorporated into construction documents and implemented in the field were in accordance with Ecology's Stormwater Manual (and the County's Addendum thereto). Experience has shown that the combination of proper design and strict field enforcement prevents violations. These practices will be continued.

SOLID WASTE MANAGEMENT (SoWM)

Compliance with construction document and performance requirements of Ecology's Stormwater Manual

Design for the replacement and expansion of the Southwest Recycling & Transfer Station (SWRTS) was completed. Construction was planned for 2001, pending receipt of a Section 404 permit. Planning and preliminary design progressed for the Airport Road Recycling & Transfer Station (ARTS), to replace the Everett Recycling & Transfer station. Grading and storm water component installation commenced in August. Plans and specifications include requirements for runoff control in conformance with the Stormwater Manual and County drainage and construction standards. Design development includes Drainage Plans, Critical Areas studies and Erosion Control Plans. Both projects have NPDES Construction Permits and will require NPDES Industrial Activity Permits.

S7B8b Existing Residential and Commercial Development Runoff

AIRPORT

Assessment and modification of existing Airport detention facilities.

- Closure devices were installed in the stormwater system. Please see text in S7B8g Illicit Storm Sewer Discharge Elimination.

SOLID WASTE MANAGEMENT (SoWM)

Assessment and modification of existing SoWM detention

Required wet and dry season inspection of Solid Waste facilities with Industrial Stormwater Permits, conducted in April and September respectively, did not reveal any need for modification of detention structures. Structures were found to be properly maintained and functioning. The new storm water detention pond at the Temporary Recycling & Transfer Station (TRTS) locale (built in 1999) functions well. The wet pond plants installed in September 2000 survived the drought and continue to provide water treatment. The TRTS operated from January through March while the Everett Recycling & Transfer Station was modified. All required stormwater management features were in place while open.

SURFACE WATER MANAGEMENT (SWM)

Capital projects to improve stormwater quality or mitigate stormwater effects

SWM spent \$150,000 in 2001 to retrofit 6 detentions ponds and to develop plans for 4 more retrofit projects to improved stormwater quality and mitigate stormwater effects.

Assessment and modification of existing residential detention and infiltration facilities maintained by the County

The assessment was completed and submitted to Ecology with the 1999 SWMP assessment.

Livestock management activities

Several programs are currently underway to manage livestock in Snohomish, the most important being partnerships with the Natural Resources Conservation Service (NRCS) and the Snohomish Conservation District (SCD).

In 2001, the Snohomish Conservation District conducted the following work on 60 small farms using funding partially provided by SWM:

- Did 5 tree planting projects covering 3.7 acres along streams
- Installed 2.8 miles of fencing, much of which was to exclude livestock from streams and wetlands.
- Implemented 153 BMPs on 18 small farms.

- Made four new site visits to assess small farm practices and to provide technical assistance.
- Designed a variety of water quality BMPs on 5 small farms and did project planning on 18 small farms
- Conducted follow up visits on 20 farms to evaluate need for maintenance on BMPs

Bank stabilization and revegetation of sensitive areas

SWM performed the following work in 2001:

- Initiated and/or managed 46 citizen based stream planting, bank stabilization, and stream clean up.
- Provided technical and educational information to approximately 400 landowners on planting native vegetation along the streams on their property to filter pollutants, for habitat, and bank stabilization.
- Provided technical information to approximately 15 landowners on planting native vegetation along the stream on their property to filter pollutants, for habitat, and bank stabilization.
- Worked on two stream clean-up projects.
- Provided educational materials at three local events
 - Lake Stevens Salmonfest
 - Stanwood-Camano Fair
 - Silvana Fair

Native plant program

The Native Plant Salvage and their volunteers salvaged over 6,850 native plants from development sites throughout the county. Volunteers contributed over 4750 hours of service to the program. Plants were stockpiled at the new Lake Stevens Native Plant Holding Facility and Nursery for later replanting on riparian restoration projects. The program responded to 233 requests for technical information regarding native plants, riparian and wetland plant communities, and restoration.

The native plant program sponsored or supported 6.5 acres of buffer plantings in the Snohomish River basin. The program planted 3.0 acres of stream buffers in the Stillaguamish River basin. Six revegetation sites were monitored for survivorship, vigor, and cover. Four people participants Stream Savers project in 2001.

Three schools planted 1,230 plants with the help of SWM staff in 2001 as part of the Salmon & Plants for Kids project. One hundred and eighty students and

several parents received classroom visits and three field trips to salvage, plant, and monitor plantings along salmon bearing streams throughout the county.

The Native Plant Stewardship Program partnered with the Washington Native Plant Society to provide instruction on appreciation, conservation, restoration of native plants and native plant communities. Twenty-five participants received 80 hours of classroom instruction and 20 hours of field instruction. Stewards return 100 hours of volunteer service in assistance with riparian restoration projects. Class had strong emphasis on riparian and wetland communities.

The newsletter *Going Native* of the Native Plant Salvage Program published two issues in 2001. The publications were mailed out to 3700 citizens.

Additional Training:

- Volunteer Vegetation Monitoring Program: 8hrs classroom & Field, trained 15 participants to monitor success of plantings in restoration projects.
- Bioengineering: Trained citizens in techniques for stabilizing stream banks in backyard setting using native plants and biodegradable materials. Eight hours classroom & field. 12 participants.
- Landscaping with Native Plants for Wildlife: 8 hours classroom and field. 10 participants.

S7B8c Municipal Storm Sewer Operation and Maintenance

SURFACE WATER MANAGEMENT (SWM)

Inspection and maintenance of detention facilities serving residential areas and the County road right-of-way

SWM inspected 198 facilities in 2001, with a total of 327 separate inspections.

SWM funded the maintenance of 61 residential facilities; Road Maintenance funded the maintenance of 3 additional facilities, for a total of 64 facilities maintained by County forces. Many more facilities were maintained either by the developer or by the homeowners.

The number of facilities maintained by the County is below the NPDES permit approximate goal for 2001, although the budget for 2001 was essentially the same as 2000. The reason for the reduced number of maintained facilities is because most of the facilities maintained in 2001 required more extensive maintenance and/or rebuilding than an "average" facility, in order to make them

function properly. With the same amount of budget, fewer facilities were able to be maintained.

Development and implementation of an ordinance defining private storm sewer system maintenance responsibilities.

The revisions to Snohomish County Title 24 that were adopted in August 1998, clearly define responsibilities for private storm sewer maintenance.

ROAD MAINTENANCE (RM)

Maintenance of catch basins, pipes, and open ditches

During the period from January 2001 through December, 2001, 6,053 catch basins were cleaned. Approximately 11.4 miles of enclosed storm sewer pipes were cleaned. Two additional vactor/jetter units were purchased during the fourth quarter of 2001. The addition of these two units will increase the accomplishments in this area.

Ditch maintenance during the same period consisted of cleaning 47 miles of ditches using either a Ditchmaster or backhoe, 1,413 lane miles of brushcutting and 13,941 lane miles of mowing along ditches. Best management practices for ditch maintenance include securing the necessary permits such as HPA, and practices such as working in no or low flow conditions, flow diversion, erosion and sediment control, and re-establishing vegetation on bare soils to prevent erosion.

Vactor grit continues to be processed through Snohomish County Solid Waste's vactor waste decant facilities. Options continue to be explored by the Solid Waste Division and RM to recycle the solids and the liquids in a manner consistent with DOE and Snohomish Health District guidelines. Vactor grit is currently being recycled by a local asphalt vendor, incorporating it into asphalt mix. Road Maintenance is exploring options for additional decant sites, including proposed construction of a decant facility at the Arlington shop, and field decanting consistent with the 2001 Ecology Stormwater Manual.

Storm sewer maintenance at Solid Waste and Parks facilities

The maintenance frequencies for cleaning the Solid Waste division's catch basins and pipes for the period January 2001 to December 2001 are similar to those established for the previous period. The maintenance is generally performed on a weekly basis at Solid Waste facilities. Storm sewer maintenance for the Parks department is performed on a request basis rather than on a

regular routine basis, but is generally performed on a seasonal basis. The vactor grit from Parks facilities, and sludge from solid waste facilities, is processed through Solid Waste's vactor waste decant facility. Options continue to be explored by Solid Waste and RM to recycle the solids and the liquids in a manner consistent with Ecology and Snohomish Health District guidelines.

SOLID WASTE MANAGEMENT (SoWM)

Vactor waste decant facility O/M

Operation of this facility continues with vactor wastes accepted from County, WSDOT, the Port of Everett, the cities of Arlington and Stanwood, and the Snohomish County Airport. The four commercial firms previously using the facility have found other, more local disposal options. Use of the facility dropped significantly this past year and is now averaging 134 tons of grit per month for the year, a decrease of 31%. An analysis of the weight per load shows a significant drop also, which may indicate that storm structures are cleaner and maintenance is "catching up". The dry summer and tighter budgets may also be causes for the decline.

Vactor grit from non-contaminated spoils continues to be recycled through Wilder Construction in Everett. Along with the drop in grit received, the recycled amount dropped to 745 tons, a decrease of 26%. The tonnage recycled now represents 46% of that received, the same rate as last year. Grit from sources not clean enough to recycle continues to be disposed of by landfilling.

No difficulties have arisen in operating the facility and maintenance has been minimal. All O&M costs are borne by user fees.

Storm sewer O/M at SoWM facilities

Road Maintenance is scheduled at least monthly to vactor storm and sewer catch basins at three County transfer stations and annually at Cathcart Landfill facility. In April, the annual wet season inspections did not reveal inadequate cleaning periods or deficiencies requiring repair. In September 2001, catch basins and storm drainage structures at industrial NPDES-permitted facilities were inspected during the annual dry inspection for unusual or illicit flows - none were found.

AIRPORT

Four Oil Water separators were cleaned. The Alpha-1, 112th street and parallel

runway detention ponds were maintained. These activities took place in 2001.

S7B8d County Road Operation and Maintenance

ROAD MAINTENANCE (RM)

Sanding and deicing

The total amount of sand applied to county roads for the period January, 2001 through December, 2001 was 2,738 tons. For comparison purposes, during the period June 1999 to December 2000, 3,546 tons of sand was applied. Approximately 9,000 tons of sand were in the period January 1998 to June 1999, and 24,000 tons of sand was applied in 1997. The primary reason for the significant differences between 1997 levels and 1998/'99/2000 levels was the difference in winter weather experienced during those seasons, and lighter application and more discriminating use of sand, such as on hills and curves. RM continues to explore alternative products for snow and ice control. Alternative products and methods have been found by other agencies to be marginally effective, costly, and extremely time critical in their application. Most products are applied in anticipation of snow/ice events. The Division will continue to evaluate alternative products as they become available.

Sweeping

To an extent, the resources expended towards sweeping are dependent on the amount of sanding activity that occurs as a result of inclement weather. RM replaced two of its aging sweepers in 1997-1998 and two more aging units in late 1999. Additionally, approval has been given for the purchase of up to eight high efficiency sweepers. During the period January, 2001 to December 2001, approximately 6,831 lane miles were swept.

RM has two facilities with prefabricated structures in which to store sweepings, until such time as the trash and deleterious material has been removed from the sweepings, and the sweepings have been tested to determine recycling / reuse options. One building is located at the Arlington shop, the other at the Cathcart facility. Both are currently in use for storage and recycling of sweepings.

Wooden bridge deck repair

During the period January, 2001 to December, 2001, the RM division continued the use of State-approved wood preservatives in bridge members to minimize water pollution. Wood used in maintenance operations is treated with Chemonite, a state approved wood preservative and alternative to Creosote.

Water based/water borne paints and sealers are used for painting and sealing bridges. RM sweeps and removes debris from bridge decks, on average, approximately once per year. This practice reduces the amount of material and waste that enters streams from bridges. Bridge maintenance practices avoid creating sediment and pollution by using appropriate best management practices.

Bridge painting

Steel truss bridges are painted by contractors using water based paint. See also "Cleaning lead painted bridge structures" below. Spot painting is performed, as necessary, by RM crews, using water based paint. Only 6 County maintained steel truss bridges remain in Snohomish County. One was slated for replacement in 2001, however, that project is behind schedule due to environmental and funding issues. Numerous steel truss bridges have been replaced with low maintenance concrete structures, resulting in less impact to the environment and water quality.

Cleaning lead painted bridge structures

Lead painted bridge structures are cleaned by contractors, prior to full painting, using containment and waste disposal practices in accordance with applicable regulations. See also "Bridge Painting" above. Spot cleaning is performed by RM using containment and waste disposal practices in accordance with applicable regulations.

Guardrail maintenance

Creosote-treated posts are no longer used for the installation or maintenance of guardrail. Guardrail posts are treated with chemonite, a State-approved, environmentally sound wood preservative. Guardrails are generally unpainted. Painted guardrails are only used in those areas where visibility is critical to ensure the safety of the motoring public. In those situations, guardrails are painted using a water based acrylic paint.

Where possible, concrete jersey barriers are being substituted for guardrail, either in new installations, or to replace worn-out guardrail sections. Jersey barriers do not require the level of maintenance that a guardrail requires. Jersey barriers are also less intrusive (they do not require excavation to install), and therefore have less impact on the environment.

Asphalt patching

Thermolay trucks used for asphalt patching utilize a self contained process that yields very little waste. The waste that is created is contained and disposed of in accordance with State regulations. The diesel-tack by-product generated by patching operations is accumulated for recycling in an above ground storage tank (AST) at the RM Arlington Shop facility. The AST is permitted by the City of Arlington (the jurisdictional authority), and meets the EPA Federal regulations for AST's. An approved recycling contractor recovers the material from the tank.

Stormwater pollution is also controlled by avoiding the use of petroleum based products for cleaning tools and equipment in paving operations. Biodegradable, citrus based products are effectively used for cleanup of tools, thereby avoiding the use of more harmful petroleum products. Emulsified asphalt is used as a tackifier for asphalt patching operations. Best management practices for application of these products includes spill prevention, spill recovery, and avoiding application during wet weather conditions.

Thermoplastic marker installation

RM continues the use of new technology equipment, purchased in 1998, for the application of thermoplastics. The equipment is more efficient than older versions, and produces virtually no waste products that have to be disposed of. Waste material is recycled in the machine and reused. The only impact on water quality from the process is the particles that result from wear of the product as traffic runs over it. Frequent sweeping can mitigate the effects of these products.

Raised Pavement markers

RM continues the use of an adhesive product and melter, which eliminates hazardous waste clean-up. The new equipment recycles its clean-up waste. As a result there are no longer waste by-products.

Paint striping

RM continues the use of water-based, acrylic emulsion water-borne paints for use in roadway paint striping. The paints contain no lead or petroleum solvents. The paints used meet or exceed federal VOC standards

Solid waste removal

There was no change in the equipment, materials or the processes used for the removal of hazardous or non-hazardous wastes from our sites or the road system during the term of this permit.

Asphalt / bituminous surface treatment

There has been no change in the equipment, materials or the processes used in the application of asphalt concrete pavements or bituminous surface treatments in the past twelve months. All excess asphalt, as well as asphalt removed during excavation operations, is recycled.

Stormwater pollution is controlled by avoiding the use of petroleum based products for cleaning tools and equipment in paving operations. Biodegradable, citrus based products are effectively used as a release agent for dump truck beds, and for cleanup of tools, thereby avoiding the use of more harmful petroleum products such as diesel.

Emulsified asphalt is used as a tackifier for pavement overlays, and as the bituminous layer in bituminous surface treatment (BST) applications. The emulsified asphalt is diluted by the manufacturer using water and soap, rather than a petroleum based "cutback" agent. Best management practices for application of these products includes spill prevention, spill recovery, and avoiding application during wet weather conditions or when the threat of rain exists. Emulsified asphalt is applied in areas sized such that it can be covered within the day and not exposed to traffic and weather for extended periods of time. These BMP's effectively mitigate the possible contamination of surface water runoff from paving operations.

Gravel road surfacing

RM continues to practice maintenance methods that minimize disturbance in the wet months, to minimize turbidity. Roads are graded and compacted, and ditches and culverts are maintained to minimize surface water runoff. Gravel roads are treated with a dust palliative, lignin-sulfonate, an approved substance that is a wood by-product of pulp mills. The dust palliative aids in maintaining a hard, compact surface and minimizes fugitive dusts.

Dust control

During 2001 RM continued the practice of applying Lignin-sulfonate to gravel roads as a dust palliative. This work is now done under contract and supervised by District Supervisors and/or Leadworkers. The equipment, materials and process used in the application of dust control treatments are substantially the same as that used during the previous term. Public Works has a program in place to pave or chip seal most of the county maintained gravel roads, thus eliminating the dust emission and turbidity problems from this source. Since 1993, Snohomish County has eliminated approximately 120 miles of gravel

roads by paving with asphalt concrete pavement or bituminous surface treatment, reducing the inventory of gravel roads to less than 15 miles.

S7B8e Water quality considerations in flood management projects

SURFACE WATER MANAGEMENT (SWM)

Levee design, maintenance, and operation

Practices were in accordance with the approved Stormwater Management Program. No new levees were designed in the reporting period. Regular maintenance and vegetation control were performed or scheduled on County-owned levees. Grass was planted for erosion control where appropriate. The Haskell Slough dike was repaired, (on the land side to reduce affects on the Skykomish River. Mitigation plantings are currently underway. Large woody debris was placed on the river side of the project to reduce impacts.

Bank stabilization

Practices were in accordance with the approved Stormwater Management Program.

Several large-scale plantings were conducted on the Snohomish and Stillaguamish Rivers, designed to reproduce historical riparian condition. The plantings encompassed approximately twenty acres.

No bank stabilization projects were built by Snohomish County in 2001, due to permitting requirements, funding and staffing issues.

S7B8f Runoff from Pesticide and Fertilizer Application

AIRPORT

Application of pesticides and fertilizer by County employees

Airport maintenance staff that apply pesticides have current training and licenses.

PARKS

Application of pesticides and fertilizer by County employees

Application of pesticides and fertilizers by Parks employees was in accordance with the approved NPDES Program.

The 2001 County budget included funding for a Parks Habitat Steward, whose primary responsibilities will focus on vegetation management, including pesticide/fertilizer application and noxious weed control.

In 2001, Parks initiated work on Integrated Vegetation Management (IVM) guidance for public park lands. The final product, to be completed in 2002, will provide policy guidance for all park lands, and offer specific strategies for weed and pest control at specific park properties. Noxious weed control strategies will also be addressed.

ROAD MAINTENANCE (RM)

Application of pesticides and fertilizer by County employees

Snohomish County Road Maintenance uses no pesticides or herbicides for roadside vegetation management, and has not done so since November 1, 1992. Only mechanical methods (mowers, graders and brushcutters) are used to control roadside vegetation, thus soil residual herbicides/pesticides are eliminated

State law requires the County to control noxious weeds within the right-of-way. The noxious weed control activity was transferred to the Road Maintenance Division on January 1, 1999. A small amount of herbicide is used in spot applications to control noxious weeds. Employees performing this work are licensed in the application of pesticides and herbicides and work under the R.C.W. authority of Snohomish County Noxious Weed Control Board.

SOLID WASTE MANAGEMENT (SoWM)

Application of pesticides and fertilizer by County employees

Occasional use of relatively benign herbicides such as Roundup has continued to be practiced for 2001. Pesticides are not being used. All chemicals are being kept in covered storage areas away from precipitation and storm drainage.

Education

General information about the environmental effects from the irresponsible use of herbicides and pesticides was made available at County sponsored household hazardous waste collection events (six two-day events in 2001) and daily at the County's household hazardous waste drop off facility. Five hundred pamphlets produced by the Washington Toxics Coalition that encourage the use of less toxic alternative products and methods were distributed to families on request. Eight thousand Natural Lawn Care booklets were printed for distribution via various avenues.

The Master Recycler Composter (MRC) volunteers distributed literature and performed public education at eight public events, some of them being multiple day events such as the Evergreen State Fair, America Recycles Day, and the county supported mulch mower sales and compost bin sales. Fifteen of the volunteers gave separate presentations for teachers that had requested them for their students at public schools. In total 34 volunteers provided 526 hours of public education.

S7B8g Illicit Storm Sewer Discharge Elimination

SURFACE WATER MANAGEMENT (SWM)

Illicit discharge elimination program enhancement

In 2001 an additional FTE was allocated to investigate water quality problems, investigate illicit discharges discovered during complaint investigation, and develop the systematic illicit discharge elimination program, for total of 2.5 FTE for these tasks.

Water quality problem investigation

As discussed in Section S7B3 - Legal Authority, Snohomish County adopted a Water Pollution Control Ordinance (Snohomish County Code Chapter 7.53). SWM staff have assisted the Code Enforcement section of PDS in their development of policies and procedures for enforcement of the ordinance. SWM staff are responsible for investigating water quality problems, determining whether violations of the ordinance have occurred, and, if possible, identifying the parties responsible for the violations. If evidence of a violation is found and a responsible party is identified, information and evidence gathered by SWM staff are turned over to PDS Code Enforcement staff, who decide whether to proceed with an official enforcement action.

In year 2001, SWM investigated 271 water quality problems, with the following disposition:

- 271 site visits were made by SWM staff;
- 204 received technical assistance
- 38 complaints were responded to by SWM and at least one other agency;
- SWM worked with Ecology water quality staff on 6 complaints;
- 73 complaints remain open and 11 are in an investigative wait.
- 5 complaints were forwarded to code enforcement for further action.
- 1 complaint was referred to another municipality because the complaint was not physically or legally in the jurisdiction of the County.
- 23 complaints of construction erosion were referred to PDS;
- 18 complaints of oil spilled or dumped;
- 24 complaints of failed septic systems, sewage or manure being released into surface water;
- 25 complaints involved materials that may be hazardous such as process waste water, household hazardous wastes, hazardous wastes and unknown chemicals;
- 8 complaints of soap or foam in surface water; and
- 5 complaints of paint dumping; and
- 16 calls listed as “other.”

Development of illicit discharge elimination program

Protocols for field screening, outfall mapping, area-specific investigations, and site-specific investigations have been developed and were attached to the 1998 report. The protocols for site-specific investigations were revised in 1998 and were attached to the 1999 report.

Field screening

100 outfalls were screened each year during the dry season in 1998, 1999, 2000 and 2001. Results of the 1998-2000 years of outfall screening have been analyzed and compiled into a report that will be completed in 2002. Results will be used to plan the future direction of the illicit discharge program.

Mapping storm sewer outfalls and tributary conveyances

The County has completed the outfall mapping work. Currently, the County is developing Master Drainage Plans for Urban Growth Areas designated under the State Growth Management Act. Comprehensive storm sewer mapping is being performed in the course of this work. See the discussion in section S7B6.

Area-specific investigations

SWM was awarded a Centennial Clean Water Grant was for an area specific investigation of the upper Swamp Creek watershed. The storm system was mapped using GPS equipment in late 1999 and early 2000. Every business in the grant area was contacted during the mapping process. Businesses identified as contributors to surface water pollution were revisited and provided with technical assistance. This project was completed in 2001. The lower Little Bear Creek industrial area is the new area-specific focus. Approximately 84 businesses have been identified for site-specific investigations.

Drainage mapping of this area was completed in 2001

Site-specific investigations

Systematic site-specific investigations conducted as part of the upper Swamp Creek watershed grant work were completed in 2001. 2 direct connections and 2 sewer leaks were identified and corrected. 84 business sites were mapped and assessed for potential water quality problems. 42 sites had potential pollution problems identified on the site. These businesses received an individual site inspection and technical assistance.

Site-specific investigations of the businesses in lower Little Bear Creek began in 2001. Approximately 24 businesses received an initial visit at the end of 2001.

Technical assistance for elimination of illicit discharges

During the year 2001 technical assistance was offered to 204 businesses. This assistance included providing information about pollution prevention, regulatory and administrative issues, and recommended site and process modifications.

Spill response coordination with emergency response agencies

SWM coordinates with the Local Emergency Planning Committee and Ecology on spill response.

AIRPORT

Prevention of Illicit Discharges from County Storage and handling of chemicals, including fuel discharges from County vehicle fueling.

Installation of berm around fueling tanks at Bldg. 219 occurred in 1999. Cost 1,000. No new activity in 2001.

Inspection/modification of activities and facilities at tenant properties.

Inspections were conducted at: BF Goodrich, Sunquest, Airport Maintenance, Tyee Aircraft, Northwest Gears Inc, Verizon Wireless.

Disconnection of aviation wash rack from storm sewer.

No new activities were reported. All aviation wash racks have been disconnected.

Prevention of contamination from deicing chemicals applied to runways.

Potassium Acetate is used for deicing runways.

Installation of spill containment equipment in County storm sewer and tenant facilities.

Aviation ramp inspections occurred on a quarterly basis in 2001.

Spill response coordination with emergency response agencies.

Coordination has occurred in accordance with the approved Program. No new activity.

PLANNING AND DEVELOPMENT SERVICES (PDS)

Enforcement of stormwater pollution control ordinance Chapter 7.53 SCC.

The water pollution control ordinance was adopted on March 11, 1998. PDS staff enforces this ordinance with the technical assistance of Surface Water Management personnel. Two FTE's have been added to staff to cover additional workload.

Implementation of materials storage and containment requirements set forth in Volume IV of Ecology's Stormwater Management Manual

As stated in Section IS7B3 and S7B8a of the program, the County adopted the 1992 Ecology Stormwater Management Manual with an addendum in September 1998. Following adoption, the County transmitted the addendum to Ecology for equivalency review. The County planned to develop its own manual, but the timing on this document production has slipped based on other priorities like ESA.

Spill response coordination with emergency response agencies

PDS's Fire Marshal and Building Official continue to coordinate emergency responses with other agencies like the Department of Emergency Management and the affected fire districts and meetings with the fire chiefs and technical advisory committees.

PARKS

Animal wash rack water / Prevention of fuel discharges / Prevention of illicit discharges from County storage and handling of chemicals / Vehicle wash water discharges

Practices were in accordance with the approved Program.

Spill response coordination with emergency response agencies.

Practices were in accordance with the approved Program. In 2001, Parks completed a new emergency action plan for the Evergreen Fairgrounds, in concert with Snohomish County's Department of Emergency Management. The plan designates responsibility for various types of incidents, including those that involve hazardous materials

ROAD MAINTENANCE (RM)

Prevention of fuel discharges

Fuel for most vehicles and equipment is obtained from commercial vendors. Above ground fuel storage tanks (AST's) are located at the Paine Field shop and the Sand Hill Pit. Fuel from these storage tanks is used for fueling equipment. The tanks are double-walled and meet the Federal EPA regulations for AST's. Containment areas surround the AST's to prevent discharge into the ground or stormwater runoff. Spill cleanup kits are carried in field vehicles to control and clean up any accidental spill in the field.

Prevention of illicit discharges from County storage and handling of chemicals.

Petroleum products are stored on containment pallets and in hazardous materials storage bins. Paint products are stored in palletized containment vessels. Paint transfer is accomplished in an area that has total spill

containment capacity. Cleanup of waterborne paint products is legally discharged into the City of Snohomish sanitary sewer system and has been permitted by DOE. All practices referred to in our plan are currently in effect.

Wash rack discharges

The wash racks continue to be inspected regularly to assure that they are functioning properly. The catch basins and sumps are vactored out and the filters are changed on a routine or "as needed" basis. A tire wash facility has been constructed at the Sand Hill Pit facility, to minimize the transport of sediments from the site.

Illicit discharge prevention during road maintenance field activities

Vehicles and equipment carry spill containment and cleanup materials. Absorbent materials and disposal barrels are stored for easy access at Road Maintenance facilities. Dangerous waste management and spill response procedures have been developed to facilitate the expedient recovery of spilled materials. Equipment is well maintained and any leaks that may result in a discharge of petroleum or chemical products are contained, and promptly repaired.

Spill response coordination with emergency response agencies.

No change during the term of this permit.

Practices have not changed from the previous reporting period. The division has developed dangerous waste management procedures. They include procedures for proper notification and coordination with the Department of Ecology and local emergency response personnel.

ENGINEERING SERVICES (ES)

Spill containment equipment and supplies at County construction sites

Contractors are required through contract provisions to keep spill containment equipment and supplies on County construction sites, in accordance with Ecology Stormwater Manual Volume II-3.

This practice will be continued through the term of the permit.

Materials handling and storage at County projects

Contractors are required through contract provisions to prevent stormwater contamination due to materials handling and storage, in accordance with Ecology Stormwater Manual Volume II-3.

This practice will be continued through the term of the permit.

SOLID WASTE MANAGEMENT (SoWM)

Prevention of illicit discharges from County storage and handling of chemicals

Practices continue to keep MSW from contact with storm runoff at Solid Waste facilities. Waste receiving areas are frequently cleaned and washed to minimize material being tracked off site. The two 40-foot covered cargo containers purchased in 2000 for improved storage of lubricating fluids and grease pails continue to provide cover from rain. In 2001 six new drop box containers were put into service. Drop box covers have sheet metal lids to keep precipitation out when the units are not being used. Older boxes most likely to leak are designated for metals collection.

During the SWPPP inspections, recycling areas at the Transfer Stations were checked for proper containment of auto waste collection and general cleanliness in addition to the normal inspection of storm drainage facilities. The containers that are provided at the auto waste areas to collect fluorescent tubes and bulbs are effective in controlling breakage. The new Transfer Stations are designed with central drainage to a blind sump and are covered to prevent rain contact with auto waste. New Spill Kits will be provided at the stations when they open for service.

No chemical spills at the various Solid Waste sites were recorded for the year.

Disposal options for hazardous waste from households and small quantity generators

The County's Moderate Risk Waste (MRW) Facility continues to provide disposal and recycling services to households and qualified businesses located in the County. In 2001, 1,476,074 pounds of hazardous waste were diverted from municipal solid waste and waste water systems in the county and safely disposed. Ten thousand, seven hundred families delivered HHW to the County's facility in 2001.

Six household hazardous waste collection events were conducted at the more remote towns of the County. Fluorescent and HID bulbs, propane tanks (seven gallon and smaller), motor oil, antifreeze, oil filters and lead acid batteries were collected at eight solid waste facilities as well as at the MRW Facility. The County continues to sponsor, cooperatively with a local auto parts chain, 22 collection centers for oil, oil filters and antifreeze. Collected and recycled were 97,775 gallons of oil, 13,226 gallons of antifreeze and 46,230 pounds of oil filters. Lead acid batteries were collected and recycled through these programs, totaling 497,212 pounds. Two hundred and ninety small quantity generators dropped off hazardous waste at the MRW Facility.

Spill response coordination with emergency response agencies

Emergency phone numbers are posted at Solid Waste transfer stations, Drop Boxes and at Cathcart. Lists are current and laminated for durability. Trained staff at the new Moderate Risk Waste facility is also available for advice in the event of a spill or emergency.

EQUIPMENT RENTAL AND REVOLVING (ER&R)

Prevention of illicit discharges from County storage and handling of chemicals.

No discharge of chemicals occurred January 1, 2001 through December 31, 2001 at Fleet Management Facilities. Other activities completed for the prevention of illicit discharges include:

- All Fleet Management shops have spill kits on site and portable spill kits have been purchased for all shop trucks that go on service calls in the field.
- The Mt. Pilchuck tank passed a tightness test when it was installed.
- Employees at all Fleet Management locations received NPDES Training by Maureen Meehan in September of 1998.
- The Fleet Management fuel tank at the Carnegie Bldg. was decommissioned in December 2001 and was removed in January 2002.

S7B8h Industrial stormwater monitoring and control

SURFACE WATER MANAGEMENT (SWM)

Inventory of industrial facilities

An industrial inventory has been completed that can be used to support investigations, generate mailing lists, and similar tasks.

Process to inform existing industries of Snohomish County stormwater requirements

Technical assistance visits are being conducted in commercial and industrial areas. Businesses are provided with information about how to comply with existing water quality regulations during these visits.

Mechanisms to ensure compliance with County requirements for industrial stormwater pollution control

Complaint call response, outfall screening and business outreach visits are used to ensure compliance with County requirements for industrial stormwater pollution control.

Method for referring industrial problems to Ecology

SWM staff has worked with Ecology staff from the Northwest Regional Office on industrial stormwater problem investigations, and will continue to do so. In 2001, SWM worked with Ecology on 6 complaint cases.

AIRPORT

Stormwater monitoring at the Airport

Inspections were performed in accordance with the Airport's Industrial NPDES Stormwater Permit.

The Airport, per Ecology's request, submitted a copy of our Stormwater Pollution Prevention Plan on October 9th, 2001.

PLANNING AND DEVELOPMENT SERVICES

Provision of NPDES Notice Of Intent (NOI) forms for proposed industrial development

The County provides NOI forms for proposed industrial development at the PDS reception counter.

Provision of information about illicit discharge prevention

PDS monitors this type of activity via complaint investigation and or mark ups on the engineering plans for stormwater control for all land development activity that creates or redevelops 5000 square feet of new impervious surface. These are the type of sites that are subject to a full drainage plan review. Through this type of review and mark up compliance with the DOE Manual is determined for industrial sites. A very small percentage of new sites appear to be affected by the illicit discharge requirements.

The County requires the plans be modified to comply with the DOE Manual BMPs if illicit discharge is an issue. If the applicant implements the plans they usually would be effective.

Review of construction documents and inspection of new construction to assure compliance with County requirements for control of industrial pollution

PDS monitors this type of activity via inspection or mark ups on the engineering plans for stormwater control. Primarily, Volume IV Urban Land Use BMPs in the DOE Manual covers items to be reviewed for industrial sites. The source control component is key to this type of activity. Proper container storage, liquid storage and loading and unloading of industrial wastes are some of the types of activities that these BMPs try to address.

The County requires the plans to be modified to comply with the DOE Manual BMPs if industrial pollution is a potential.

S7B8i - Education

PLANNING AND DEVELOPMENT SERVICES (PDS)

Employee education

The Planning and Development Services staff completed several workshops and training seminars during 2001 subsequent to implementation of the drainage and grading ordinances. The training sessions emphasized how important the staff's role in inspecting stormwater pollution is.

Beneficial uses such as fish usage of streams and wetlands, swimming and maintenance of clean drinking water supply were emphasized. By being better informed the staff are able to make informed decisions whether or not a particular activity is likely to cause harm or reduce the quality of water impacted by the stormwater pollution. The staff was empowered to make these types of decisions in the field if violations of the water pollution control ordinance were being created.

PDS has implemented a regular training of employees for erosion control. The ongoing training of PDS staff was a workplan element for 2001. The level of compliance in the field has improved considerably subsequent to the new ordinance adoption, initiation of educational training efforts and implementation of same. Thus PDS believes these measures are effective if fully implemented. However, it is still apparent that there is room for improvement and that stems from a lack of resources to fully monitor and inspect job sites on a daily basis. Workload and staffing prohibit a site visit to every site except when an inspection is called into PDS. There was a marked increase in agricultural and road building activity that was exempt due to recent passage of the Right to Plow initiative by the voters.

Weekly training sessions are occurring in-house within PDS. PDS utilized the DOE Grant funded position to assist in the training effort for a half of 2001. This position also closely monitored the new land development activity and erosion control practices in the Quilceda/Allen Creek Watershed. Clearly, additional resources in the training effort would improve effectiveness. In the interim, the county is partnering with Edmonds Community College and a consultant team this year to get the DOE/County erosion control and BMP message out to the contracting and building industry community.

We solicit feedback on a regular basis from staff to see if they have questions regarding their duties and responsibilities. We also keep track of the number of people from the general public that receive specific training targeted at erosion control and water quality protection.

Compliance has improved, however the total number of violations and stop work orders has also increased as a result of this education and empowerment effort of staff. The Low Impact Development (LID) classes were offered in May and July at Edmonds CC in which the Master Builders, PDS and the College partnered to train a number of construction managers and builder/contractors. Feedback from the students was positive. They were coached toward thinking of a goal of less impact or zero impact development.

Our efforts to educate the public were enhanced with additional computer software and hardware like a notebook computer to be able to display the PowerPoint presentations in a very readable format. Also, getting out in the field and actually showing staff and the public those examples of BMPs that work and how to install it. Certain BMPs like covering with plastic are certainly not the overall best solution for overall watershed health due to increased bank scour downstream. The county will provide a feedback loop into our training system to provide insight to the office staff how the field implementation of BMPs is working.

PDS employees requested a minimal number of off-campus educational opportunities on this subject during the previous year. Although several of the staff attended a two-day seminar put on by the Washington State Department of Transportation (WSDOT) to be certified as erosion control specialists. The drainage plans examination, grading, and site review and now the commercial inspection staff meet weekly to stay current on erosion control issues and problems. The PDS drainage staff also meets bi-weekly with surface water staff to review drainage complaints, maintenance issues, and what is practical that works in the field. In-house training dominates the PDS effort. Qualified PDS staff assisted in team teaching several full day college courses on zero impact development and erosion control to college students and builders at Edmonds Community College where the County partnered with the college to educate the public.

SOLID WASTE MANAGEMENT (SoWM)

Stormwater monitoring at County solid waste facilities regulated by NPDES industrial stormwater discharge permits

Stormwater monitoring was performed for the year at NPDES industrial permitted sites as required by other agencies (SHD and/or municipal requirements).

AIRPORT

Employee education

Airport employees received education about stormwater pollution prevention in the course of related training. This practice will be continued during the term of the permit.

Public Education

Information about stormwater pollution prevention was provided to Airport tenants during routine inspections.

PARKS

Employee education

Park's employees received education about stormwater pollution prevention in the course of related training such as spill response and pesticide application. Education efforts included the following:

Three employees maintained their pesticide application license, and received annual training and product updates; and in 2001, 5 Senior Rangers and 4 maintenance personnel completed the Adopt-A-Stream Streamkeeper Academy, which provided broad based education about best management practices for stream health. Stormwater issues were covered in this training.

ROAD MAINTENANCE (RM)

Employee education

Road Maintenance employees continue to receive training and education about stormwater pollution prevention and erosion control best management practices (BMPs). Snohomish County Road Maintenance has been an active participant in developing a training program on BMP's for water quality and fish habitat protection. The training program is being developed at the request of, and under the guidance of the Regional Road Maintenance Endangered Species Act Technical Working Group. The Washington State Department of Transportation Technology Transfer Center will administer the program. The University of Washington is developing the training curriculum. Snohomish County Road Maintenance plans to have all road workers trained in the implementation

of BMPs under this program. A hazardous waste response team has attended the *Hazardous Materials Training* program and can respond to assist in the clean up of hazardous waste spills.

Staff involved in the control of street wastes meet frequently with their counterparts in other municipalities to discuss methods of minimizing pollution while maximizing operational efficiencies and cost. Examples of this are the work being done relating to the collection and recycling or disposal of vactor grit and street sweepings.

Ecology Best Management Practices have been established at the County's Sand Hill Gravel Pit for the prevention of water pollution and soil erosion. The employees working at that facility have been trained in the application and monitoring of these practices to ensure that the Pit is in compliance.

Regular monthly meetings are being held with Washington Department of Fish and Wildlife Area Habitat Biologists. The purpose of these meetings is to discuss upcoming maintenance activities such as ditch cleaning, shoulder repairs, etc., where the work occurs in or near water bodies. Discussion topics include timing of work, best management practices to be implemented during the work, possible long term solutions to chronic maintenance problems, and possible mitigation measures.

SOLID WASTE MANAGEMENT (SoWM)

Employee education

Walk-through refresher training was conducted for site managers during the six NPDES Wet and Dry inspections. New employees are instructed on facility day-to-day operations including proper daily cleanup and washdown, as well as surveillance and cleanup of recycling areas. A spill prevention and spill cleanup video is being incorporated into training for Operations staff members.

Public education

The Solid Waste Management Division provides brochures, pamphlets and flyers to the public on a wide variety of topics including composting, environmentally friendly lawn and garden care methods, automotive maintenance, less toxic products, and general home maintenance methods friendly to the environment. These materials were updated and reprinted, and new brochures developed during the year. The intent is to convince families to remove hazardous waste from their homes, to reduce their purchases of hazardous products, and to store

these products safely. The materials are distributed through a variety of outlets, including the MRW facility, Master Recycler Composter graduates, Transfer Stations and Drop Boxes, schools, and cooperatively with other cities and agencies. For instance, "Natural Lawn Care" brochures were provided to 2,300 middle school students participating in the "In Concert with the Environment" educational program, partially funded by the Solid Waste Division.

The active Master Recycler Composter volunteers continued to assist with educating the public. They promoted natural lawn care and composting at the Division's booth at the County Fair. Brochures distributed included composting, natural lawn care, and alternatives to hazardous products.

Small Quantity Generator (SQG) education

An average of five businesses weekly were provided technical assistance related to proper management and disposal of hazardous waste. One hundred and ninety SQG's disposed of their hazardous waste at the County's Moderate Risk Waste Facility.

A newsletter on waste prevention, safe disposal and proper storage of business hazardous waste was mailed to twenty-five thousand businesses and agencies in the county.

Twenty-two new businesses qualified to participate in the EnviroStars program that required them to comply with strict storage, labeling and disposal rules for their hazardous waste.

Thirteen past EnviroStars businesses renewed their participation in the program.

In 2001, the County continued to utilize Cascadia Consulting Group to assist in outreach to SQG's and expand the Envirostars program. Cascadia completed the following education-related tasks:

Outreach:

The consultants conducted initial on-site technical assistance and follow-up visits to 23 businesses in Snohomish County. This process entailed contacting the business, scheduling a visit time, conducting an on-site walk-through, following up with the business, coordinating with the Solid Waste office to mail out letters and any information the business might need, and helping the business fill out its EnviroStars worksheet.

- **EnviroStar renewals:** The consultants conducted renewal visits to 13 EnviroStars businesses.

- **New EnviroStars:** The consultants qualified 18 new EnviroStars during this time period, which is 81% of the new EnviroStars members and 49% of the total number of Snohomish County EnviroStars.
- **Success stories:** Cascadia contracted with PRR to write EnviroStars success stories for two businesses.
- **Governor's Award nominations:** The Cascadia task manager wrote nomination applications for two 5-star businesses for the Governor's Award.

SURFACE WATER MANAGEMENT (SWM)

Employee education

SWM provided the following in-house seminars:

Date	Topic	Speaker
1/23/01	SWM Overview	Joan Lee
1/30/01	ESA, Flood Hazard Planning	Meg Moorehead
2/6/01	Infrastructure	Karen Kerwin
2/13/01	WQ, Lakes, Ground Water	Bill Leif
2/20/01	River & Habitat CIPs	John Engel
2/27/01	Outreach & Volunteerism	Lynda Ramsley
3/20/01	SWM Web site	Jeff Carter
4/3/01	GPS Surveying	Mike McGuinness
5/1/01	Citizen Advisory Committee	Lynda Ramsley
5/15/01	Fish	Michael Purser
6/19/01	Code Enforcement	Alison Warner - PDS
7/17/01	Habitat Inventory	Ted Parker
8/7/01	Darrell's program/projects	Darrell Smith
9/4/01	Native Plant Program	Scott Moore
9/18/01	Temperature Survey	Kathy Thornburgh
10/2/01	Flood Response	Cheri Clark
11/6/01	Retreat Follow-up	Randy Cowart
11/20/01	Ground Water	Jalyn Cummings
12/4/01	Stilly Stewardship	Jake Jacobson

Public education conducted during other SWM activities

The Watershed Education Program reached approximately 5,808 citizens (about 6,689 contact hours).

Watershed Keeper Series

- 3/5-5/14/01 Watershed Keeper Class - a total of 27 citizens participated in this eleven-week (47-hour) series.
- 9/5-11/14/01 Watershed Keeper Class - a total of 23 citizens participated in this ten-week (47-hour) series.
- The topics of water quality, nonpoint pollution sources, pollution prevention, and BMPs were woven into discussions nearly every evening. It is estimated that water quality was the focus of approximately 40% of the series.

Water Quality Monitoring Workshops

- 1/1/01-12/31/00 Surface Water Management loans field test kits to interested teachers and citizen. During the report period test kits (turbidity tubes, DO test kits, pH test kits, and thermometers) and aquatic insect sampling equipment were loaned to numerous school teachers or groups.

Teacher Workshops

- 2/2 & 3/01 Salmon: Past, Present, & Future - a total of 28 educators participated in this 10-hour workshop held at the PUD in Everett. The primary topic was salmon, however, approximately 20% of workshop tied back to water quality, nonpoint pollution sources, and pollution prevention.
- 4/17/01 Learning About the Land - a total of 4 educators participated in this 4-hour workshop held in Everett. The primary topic was land use, however, approximately 20% of workshop tied back to water quality, nonpoint pollution sources, and pollution prevention.
- 10/5 & 6/01 Salmon: Past, Present, & Future - a total of 28 educators participated in this 10-hour workshop held at the PUD in Everett. The primary topic was salmon, however, approximately 20% of workshop tied back to water quality, nonpoint pollution sources, and pollution prevention.

Watershed Tours

10/13/01 A watershed tour of the Stillaguamish River Watershed was offered. Approximately 20 citizens attended.

Confluences

Date	Topic	Speaker	Participants
1/16/01	Riparian Ecology	Andy Loch	25
2/7/01	Salmon Watch	Roger K	30
2/22/01	Nearshore Ecology	Ron Thom	20
3/13/01	Introduced Species	Sonny Gohrman	20
4/10/01	Bull Trout	Curt Kraemer	25
6/12/01	Urban Land Uses	Suzi Wong Swint	15
8/10/01	Restoration Projects	Suzi Wong Swint	15

Snohomish County SWM staffed information booths at the following community fairs:

Date	Event	Participants
8/11 & 12/01	The (Stilly) Festival of the River	~200

Distribution of Educational Material to Streamside Landowners

Over 200 packets of information on water quality and other streamside issues were sent to residents living on the Middle Fork Quilceda Creek as part of a grant provided to a citizen to provide cedar trees to the landowners. Friends of Cemetery Creek, a citizen watershed restoration group, distributed over 150 packets.

Thirty-three stream and watershed identification signs were installed in the Cemetery Creek watershed.

Farm/Livestock owner education conducted by the Snohomish Conservation District with funding from SWM

One farm fair, one woodlot management seminar, one Horses for Clean Water workshop, and one pasture management workshop were held with 230 participants. Educational material was provided at booths at 7 fairs and community events. Four quarterly newsletters with information on small farm impacts on water quality was produced and distributed.

Public Education Conducted as Part of the Lake Monitoring Program

Education efforts related to lakes are discussed under S7B4 Lakes Monitoring.

Onsite sewage system owner education

The Snohomish Health District continues to perform this education. The Health District receives funds through the Stilliguamish Clean Water District to do this education in the Stilliguamish watershed.

EQUIPMENT RENTAL AND REVOLVING (ER&R)

Employee education

ER&R staff received training and information regarding pollution prevention and spill control through regularly scheduled safety meetings

ENGINEERING SERVICES (ES)

Activity: Employee education

ES employees receive education about stormwater pollution prevention in the course of specific targeted and related formal and informal training. For example, ES contracted with WSDOT to present formal 2-day certification training in CSESC to over 50 employees in December 1999. This included all construction group employees and most designers. Education continues in staff meetings and on-the-job experience, and with new employees being sent to formal training.