

Snohomish County, Washington
NPDES Municipal Storm Sewer Discharge Permit
Annual Report, January 2003-December 2003

I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for willful violations.

Aaron G. Reardon, Snohomish County Executive

Date

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Introduction

This report describes activities performed by Snohomish County in the year 2003 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.

Departments and divisions within Snohomish County independently prepare reports on their activities under the permit. Surface Water Management Division, in addition to reporting on its activities, collates the information for Executive signature and submission to Ecology.

S7B1 Stormwater Management Program Planning Process

Stormwater Management Program for 1997 - 2000

The County's Stormwater Management Program (SWMP) describing activities for the years 1997 - 2000 was approved by Ecology in a letter dated July 16, 1997.

Stormwater Management Program for 2001 and Beyond

The NPDES permit issued in 1995 expired in 2000. Ecology has not yet issued a new permit. In 2000, Ecology extended the coverage of the 1995 permit until a new permit is issued, and directed Snohomish County to continue work under the terms described for the year 2000 in the approved SWMP.

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.

Water quality problems

The following water quality reports were prepared by Snohomish County Surface Water Management in the year 2003:

In March 2003, SuWM published a report summarizing and analyzing the results of all the lake monitoring data collected through the years for Snohomish County lakes. The report, titled Snohomish County State of the Lakes Report, contains individual booklets describing the water quality conditions in each of 35 lakes and

a County-wide summary comparing the conditions among these lakes. The entire report is available on the web at

<http://www.co.snohomish.wa.us/publicwk/swm/Publications/200303StateOfLakes/+Index.htm>

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.

In 2003, Snohomish County extended exemptions in its grading and drainage codes to the construction of drainage structures in public rights-of-way, if this construction is regulated under certain types of right-of-way use permits issued by the County under its right-of-way use code. The substantive requirements of the drainage and grading codes can also be applied through these right-of-way use permits. The purpose of this change was to prevent the need for an applicant to get two permits, each of which requires the same thing. This change to the drainage and grading codes essentially affects only the administrative process.

The drainage code (S.C.C. 30.63A) and grading code (S.C.C. 30.63B) can be viewed on the Snohomish County Internet site at <http://www1.co.snohomish.wa.us>.

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 was readopted with some minor changes that clarified procedural responsibilities of the departments of Public Works and Planning and Development Services in 2001. A copy of the readopted code was attached to the 2001 Annual Report.

Since the adoption of the original ordinance in 1998, 45 water quality investigations have been referred to Planning and Development Services for enforcement action. Investigation and enforcement is discussed in sections S7B8a&g.

S7B4 Monitoring

SURFACE WATER MANAGEMENT (SuWM)

SuWM staff performed a number of monitoring activities during the reporting period. The information gained is used to guide a number of County activities, including capital and stream restoration projects intended to improve water quality.

Rainfall and stream-flow gaging

Table 1 shows the gauges operated in 2003. Rainfall and stream-flow gauging data were collected at 30 sites during the reporting period. Six 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 at

http://198.238.192.103/spw_swhydro/hydrology-find-site.asp

The County also shared costs for the operation of 4 gages operated by the USGS, and collected rainfall data from two volunteer operated sites.

Table 1 - Gauges Operated in 2003

Gauge type	Number
Base Stations	2
Repeaters	2
Field Sites	30
USGS	4
Volunteer	2
Total	40

Long-term physical\chemical monitoring in streams and rivers

During the reporting period, SuWM conducted long-term monitoring as described in the 1997 Stormwater Management Program at 25 sites. These sites are described in Table 2. Water samples at sites were analyzed for the parameters listed in Table 3.

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 2 - 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.
DUBQ	Dubuque Creek on OK Mill Road	Evaluate contribution of Dubuque and Panther Creeks to Pilchuck River
PILR	Pilchuck River at 6th St	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

Table 2 continued - Long-term Water Quality Monitoring Sites

<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 148 th	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 180 th	Evaluates residential and hobby farm runoff
LBLD	Little Bear Creek at 228th St	Evaluates rural and commercial runoff

Table 3 - 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

SuWM began long-term monitoring in the South County in 1992, in the Snohomish basin in 1993, in the Stillaguamish basin in 1994, and in the Pilchuck River watershed in 1998. Analysis of variance was used to compare seasonal means of data through 2003. A general linear model was used for analysis of variance to compare individual water quality parameters by year and season. With at least ten years of data from all the sites except the Pilchuck River watershed, the analyses showed the following results.

- The South County streams, Stillaguamish mainstem, Glade Bekken and Portage, Pilchuck, and Church Creeks showed no significant changes in fecal coliform bacteria. However, Ecology showed a significant decrease in fecal coliform bacteria in Glade Bekken in 1999 using a step trend analysis. This decrease followed implementation of small farm best management practices in that watershed. There were no differences by year in the Pilchuck River sites but fecal coliform levels in Catherine Creek were significantly higher than those in the Pilchuck River, Dubuque, or Little Pilchuck Creeks. Lower French Creek showed a decrease in bacteria from 1997 through 2001 with a slight increase in 2002 and 2003.

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- Dissolved oxygen increased significantly in the mainstem Stillaguamish River, Pilchuck Creek, Church Creek and Glade Bekken from means of about 9.0 mg/l to 10.5 mg/l. No significant changes in dissolved oxygen were found at any other sites.
- North and Swamp Creeks showed no significant changes in conductivity. Conductivity in Little Bear Creek increased significantly from a mean of 80 umhos/cm in 1994 to a mean of 120 in 2003 with most of the increase occurring from 1994 through 1998. The mainstem Stillaguamish showed a significant increase in conductivity from 35 umhos/cm in 1994 to 75 umhos/cm in 2003. The conductivity levels in Little Bear and the Stillaguamish may correspond to a change from rural land uses to watersheds with more residential and urban land use.
- No trends were seen in total suspended solids at any sites. Analysis was not conducted for turbidity, since monthly testing was not begun until 1998.
- No trends were detected in nitrate concentrations. The only significant change in total phosphorus occurred in Little Pilchuck and Catherine Creeks with an increase in 2003. With only five years of data from these creeks, this increase should be monitored over the next few years to determine if the trend continues.
- Sites in North, Swamp, Quilceda, and Allen Creeks showed a significant decrease in lead concentrations from 1992 through 2003 with most of the decrease occurring by 1997. This decrease may be a result of reduced ambient lead levels as unleaded fuels became more widely used. Significant changes in lead levels were not detected in any other watersheds. No significant changes in copper or zinc were found in any watershed.

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 and maintaining a database of all water quality, benthic invertebrate, and temperature logger data which is accessible on the Web at http://198.238.192.103/spw_swhydro/wq-search.asp
- working with Ecology to develop a cleanup implementation plans for the Snohomish River tributaries and North Creek TMDLs, and
- providing discharge and staff data to 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:

- continuing an interlocal agreement with the City of Bothell for monitoring in North Creek and maintaining a flow gauge,
- participating in the North Creek Municipal Workgroup to coordinate efforts in fecal coliform reduction under the TMDL,
- assisting the cities of Lake Stevens and Mill Creek 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 and report review in the Stillaguamish,
- coordinating sampling with the Stillaguamish Tribe in the Stillaguamish watershed, sharing data, and assisting the Department of Health and Stillaguamish Tribe in water quality sampling in Port Susan for shellfish bed re-certification.

Short-term physical/chemical monitoring in streams and rivers

During the reporting period, SuWM conducted short-term monitoring as described in the 1997 Stormwater Management Program. Beginning in April 2000, SuWM 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.

Data through 2003 show the highest bacteria levels in the upper mainstem of Little Bear Creek, with significant increases over the last two years. The geometric mean in the mainstem headwaters was 680 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 40 to 80 col/100 ml. High bacteria levels in the upper watershed led us to identify small farms with water quality problems in need of best management practices. We have worked with the Snohomish Conservation District in this area to develop farm plans and implement BMPs. We also identified a pond with a possible waterfowl contribution to bacteria in the upper watershed.

Levels of total copper, lead, and zinc in Little Bear Creek are of concern. The concentrations of metals are highest in the lower, more urban and commercial areas of the creek. High metals levels in the lower watershed made this area a focus for visiting businesses and providing technical assistance in reducing nonpoint pollution.

In November of 2003 we discontinued sampling at the Little Bear sites (Table 4) and initiated a focus area in North Creek (Table 5). The North Creek focus coincides with the TMDL in that watershed and supports efforts by the municipalities in the North Creek Municipal Workgroup. The workgroup was formed by Ecology to coordinate efforts to reduce fecal coliform pollution in North Creek by implementing activities in the TMDL. We chose sites near the mouths of four tributaries in the watershed to give us better coverage in water quality data. Data collected at these sites will provide baseline data for the County's new Stormwater Quality Centennial grant in North Creek as well as for TMDL implementation.

Table 4 – Discontinued Little Bear Water Quality Monitoring Sites

Site	Location
LBHW	Little Bear Headwaters on Interurban, just east of 51 st 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

Table 5 – Additional North Creek Water Quality Monitoring Sites

SULPHUR	Sulphur Creek south of 196 th St SE
NCMU	Silver Creek at 196th St SE
TAMMOUTH	Tambark Creek mouth upstream of 196 th St SE
FILBERT	Filbert Creek at 208 th St SE and 13 th Dr SE

Benthic invertebrate monitoring

The 1997 Stormwater Management Program stated that SuWM would conduct benthic invertebrate monitoring in Glade Bekken in 1997 and 1998 and in French Creek in 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, SuWM 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. SuWM also monitored an additional 22 sites in the Stillaguamish watershed, of which 6 sites were part of a comparison study with Ecology's TMDL study. In 2002 SuWM monitored one agricultural BMP site in Church Creek and 16 sites in the Bear, Little Bear, North, and Swamp Creek watersheds. In 2003 SuWM monitored 15 sites in the Snohomish watershed and two agricultural BMP sites. Table 6 presents the benthic invertebrate survey results, and the results for agricultural BMP monitoring. Protocols for invertebrate monitoring followed those established by Ecology with modifications for use with the IBI, similar to the protocols used by King County. SuWM sampled riffles, taking three uncomposited, replicate samples at each site. We analyzed the data using James Karr's Index of Biological Integrity (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. The IBI scores give information that can be added to the data from the chemical monitoring to give a more comprehensive understanding of impacts from increasing development and stormwater runoff.

Table 6 - Benthic invertebrate survey sites and locations

Benthic Invertebrate survey	1997 BIBI	1998 BIBI	1999 BIBI	2000 BIBI	2001 BIBI	2002 BIBI	2003 BIBI	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 pilc
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 Elementary
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

Table 6 continued - Benthic invertebrate survey sites and locations

Benthic Invertebrate survey	1997 BIBI	1998 BIBI	1999 BIBI	2000 BIBI	2001 BIBI	2002 BIBI	2003 BIBI	Site location
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				40	
May Creek			42					
Cemetery Creek (Snohomish trib)				28			24	Steward project, 85 TH , S of 72 ND on mainstem
French Creek gage	38		36				42	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
French Ck, lower mainstem, 159th			30					Mainstem – 159 th
Cripple Creek	32		32					Upstream of 179th
Spada Ck			40				44	Trombley and Spada
Golf Course Ck			36					Downstream of Westwick Rd

Table 6 continued - Benthic invertebrate survey sites and locations

Benthic Invertebrate survey	1997 BIBI	1998 BIBI	1999 BIBI	2000 BIBI	2001 BIBI	2002 BIBI	2003 BIBI	Site location
<i>Snohomish Watershed, continued</i>								
Chain Lake Creek			18					Trombley and Chain L Rd
Upper Woods Creek			26				40	Off Woods Ck Rd
Woods – Lake Roesiger			36					Outlet from L Roesiger, above confluence w Woods
Woods Ck – Pipeline Rd			22				32	E of 21 st Ave SE
Woods Ck – Bridge 298			34				34	Bridge 298, S of powerline
Woods Creek mainstem	34		28				40	WQ site wcms
Woods Creek west fork	26		34				30	WQ site wcwf
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	28 Pl NE, off Russell Rd
Pilchuck R – Snohomish Bridge 304			20				26	WQ site pilr
Little Pilchuck Creek			34				32	WQ site lpil
Catherine Creek			26				20	WQ site cath
Dubuque Crk			32				38	WQ site dubq

Table 6 continued - Benthic invertebrate survey sites and locations

Benthic Invertebrate survey	1997 BIBI	1998 BIBI	1999 BIBI	2000 BIBI	2001 BIBI	2002 BIBI	2003 BIBI	Site location
<i>Snohomish Watershed, continued</i>								
Panther Creek	26		30					Upstream of 16 th St SE
Bunk Foss			14				40	Downstream of culvert on Machias Rd, farther upstream in 2003
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			20		WQ site ncl, UW site
North Creek						28		164 th St
North Creek						28		192 nd St
North Creek						24		208 th St
Silver Creek						18		208 th St
Penny Creek						16		9 th Av SE
Penny Creek						20		Mill Creek
Nickel Creek						22		Hwy 527
Sulphur Creek						22		196 th St SE
Swamp Creek gage	22		20			28		WQ site scld
Swamp Creek						20		164 th ST
Swamp Creek						30		Larch and Locust
Little Bear upstream	34		34	30				WQ site lblu, UW site
Little Bear downstream	30		28	30				WQ site lbd, UW site
Little Bear headwaters				34				WQ site lbhw
Trout Stream				34				WQ site trot
Great Dane				34				WQ site dane

Table 6 continued - Benthic invertebrate survey sites and locations

Benthic Invertebrate survey	1997 BIBI	1998 BIBI	1999 BIBI	2000 BIBI	2001 BIBI	2002 BIBI	2003 BIBI	Site location
<i>South County Watershed, continued</i>								
Cutthroat Creek				34		38		WQ site cutt
Little Bear near mouth				28				Woodinville site lwcc
Cutthroat Creek						38		Highway 9 project
Little Bear mainstem						36		189 th St SE
Bear Creek						16		Headwaters at Paradise Lake Rd

Table 6 - B-IBI results at agricultural BMP project sites

Benthic Invertebrate survey	1997 BIBI	1998 BIBI	1999 BIBI	2000 BIBI	2001 BIBI	2002 BIBI	2003 BIBI	Site location
Glade Bekken - 220th (Stillaguamish tribe)	32	32	32	32	34			Reference site
Glade Bekken - Sylvana Terrace	28	30	36	32	32			Reference sites, WQ site tr30
Glade Bekken - 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
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	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
Church Creek- Jensen Rd						34 pre	32 post	BMP evaluation, Jensen Road
Church Creek at 284th							26 pre	BMP evaluation, 284 th

Physical/chemical monitoring of lakes

Routine Monitoring

During the summer of 2003, SuWM staff and citizen volunteers monitored 27 priority public access lakes once each month in June, July, August, and September, for a total of four times during the growing season. The lakes sampled were Armstrong, Blackman, Bosworth, Cassidy, Chain, Cochran, Crabapple, Echo, Flowing, Goodwin, Howard, Ketchum, Ki, Loma, Lost, Martha (N), Martha (S), Panther, Riley, Roesiger (N), Roesiger (S), Serene, Shoecraft, Stickney, Storm, Sunday, and Wagner.

In addition SuWM staff and volunteers monitored Beecher, Bryant, Kayak, Meadow, Nia, Rowland, and Ruggs lakes from one to four times during the summer. Drainage Improvement District #8 of Lake Stevens also monitored Lake Stevens bi-weekly and Lake Cassidy twice during this period.

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

Selected citizen volunteers monitored the remaining 18 priority lakes during the same one week periods each month (except for occasions when volunteers were unavailable and the sampling was performed by SuWM staff). The volunteers collected epilimnion and hypolimnion total phosphorus samples, epilimnion chlorophyll *a* and pheophytin 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. At 14 of these lakes, the volunteers also collected dissolved oxygen and temperature profile data throughout the water column using LaMotte kits and modified vertical water samplers. At Beecher, Kayak, Meadow, Nina, Rowland, and Ruggs lakes, volunteers collected only epilimnion and hypolimnion total phosphorus samples and made Secchi depth measurements and qualitative observations of algae and zooplankton.

Sampling during 2003 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 averages from four epilimnion total phosphorus and chlorophyll *a* samples also provide a basis for determining the trophic status of each lake. Combined with the summer average Secchi depths recorded by citizen volunteers and SuWM staff, the total phosphorus and chlorophyll *a* averages give a more comprehensive view of lake conditions.

Basic Volunteer Monitoring

During 2003, SuWM staff supported citizen volunteers at 24 lakes in Snohomish County. These lakes were: Beecher, Blackman, Cochran, Crabapple, Flowing, Goodwin, Kayak, Ketchum, Ki, Martha (N), Martha (S), Meadow, Nina, Panther, Riley, Roesiger (N), Roesiger (S), Rowland, Ruggs, Serene, Shoecraft, Stickney, Storm, and Sunday.

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 were asked to monitor every two weeks from May through October to cover the entire growing season. The number of dates for which data were received from individual volunteers in 2003 varied from two monitoring sessions to twelve. In addition, as described above, volunteers at 14 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 and chlorophyll *a* samples.

The volunteer monitoring program is an important element of physical/chemical lake monitoring because the data are combined with SuWM staff monitoring to better assess lake conditions and the potential impacts of nonpoint pollution. All of the 27 priority lakes, as well as the 7 other lakes monitored in 2003, 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

SuWM staff managed and analyzed lake quality data using a SQL server database with an Access client interface. Monitoring results were provided to volunteers, the general public, and other agencies as requested. In addition, all lake quality data collected in 2003 were added to SuWM's on-line database. These data are available to anyone with Internet access at http://198.238.192.103/spw_swhydro/lq-search.asp

In March 2003, SuWM published a report summarizing and analyzing the results of all the lake monitoring data collected through the years for Snohomish County lakes. The report, titled Snohomish County State of the Lakes Report, contains individual booklets describing the water quality conditions in each of 35 lakes and a County-wide summary comparing the conditions among these lakes. The entire report is available on the web at <http://www.co.snohomish.wa.us/publicwk/swm/Publications/2003-03StateOfLakes/+Index.htm>

Public Education Conducted as Part of the Lake Monitoring Program

SuWM staff conducted a training workshop for all the citizen volunteers in May 2003. 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, SuWM staff took advantage of opportunities for one-on-one public education on a regular basis with citizens while in the field for lake monitoring and when citizens called with questions about lakes.

S7B5 Fiscal Analysis

Table 7 shows calculated or estimated actual expenditures for 2003, compared to expenditures proposed in the Program. In some cases, expenditures could be directly tracked in the County's financial system. In other cases, costs were estimated from information such as the total number of actions of a certain kind multiplied by the estimated average cost, or the knowledge that a certain person worked a certain number of hours on NPDES related tasks.

Table 7 - 2003 proposed and actual expenditures (in \$1,000 units)

Program element	Proposed expend. (Based upon 2000 Exp)	Actual expend	Comments
S7B1	57	33	Permit fee
S7B2	15	10	Miscellaneous legal review
S7B3	20	10	Industrial permit review
S7B4	281	463	River gaging, long term WQ Monitoring
S7B5	0	0	
S7B6	96 Base (2200 extra for DNR project)	212	Increase due to intensive storm sewer mapping in UGA's
S7B7	18	30	
S7B8a	358	95	Decreased # of drainage review permits
S7B8b	273	685	2003 Increase in WQ Capital Projects
S7B8c	802	1950	Road Maintenance BMP's
S7B8d	83	864	Road Maintenance BMP's
S7B8e	0	0	
S7B8f	0	0	
S7B8g	185	179	WQ Investigations and Compliance
S7b8h	28	10	
S7B8i	290	546	
TOTAL	2506	5087	The primary reasons for increased expenditures are the intensive storm sewer mapping, water-quality-related expenditures in Road Maintenance. SuWM Water Quality Capital Projects

S7B6 Data Management

PLANNING AND DEVELOPMENT SERVICES (PDS)

Development and maintenance of land use, zoning and environmental GIS data sets and maps.

1. Geographic Information System (GIS) data and map products continue to be updated for the Growth Management Act (GMA) Comprehensive Plan – Future Land Use. This includes the maintenance and update of data through adopted revisions to the plan designations in the unincorporated County area and in the urban growth areas. The Future Land Use designations were converted to the new high accuracy
2. Urban growth area (UGA) boundary – city boundary maps have been produced using the new high accuracy Integrated Land Records (ILR) parcel base, and are continually updated with annexations and UGA boundary revisions.
3. In conjunction with the GMA Comprehensive Plan, PDS has mapped open space / greenbelt, commercial agriculture, forestry, and lands useful for public purpose for the County in GIS digital format.
4. The Urban Centers projects have continued to use the PDS GIS support for required GIS data set construction, statistical analysis, consultant coordination, and the preparation of map displays, and graphics.
5. The PDS Future Land Use plan 10 year Update project required significant GIS data and map support for the proposed alternatives and associated analysis.
6. The Future Land Use Plan Mineral Lands study continued to use GIS data analysis, inventory and display mapping products.
7. Capital facility sewer and water GIS data sets continued to be enhanced with additional line data.
8. The PDS ¼ section zoning maps, the current digital zoning GIS data set and small scale display maps continue to be updated and maintained by PDS.
9. Zoning data conversion from the current low accuracy digital parcel base to the new ILR parcel base was completed in 2003.

10. Conversion of supporting information layers that are included on the PDS ¼ section zoning maps continued. The digital layers are being constructed from hard copy information and put into GIS data coverages. These GIS layers will be used with the newly converted master zoning data, (and the ILR parcel base), to construct new ¼ section zoning maps. New ¼ section maps are being replaced on the PDS zoning/permit counter and digital images of the maps are also being generated.
11. PDS, in cooperation with other County departments, the BIA and the Tulalip Tribes have developed a tribal trust lands data base, GIS ArcView project distribution application, GIS display map and an update/revision process to accurately identify tribal trust lands in Snohomish County. Update, data maintenance, and map production continue.
12. The engineering staff within PDS continues to utilize GIS during plan review to assist in their assessment of site plans and development proposals.
13. The 2003 Docket process was completed with significant display mapping and data set revisions as the result of Council ordinance adoption: Future Land Use Plan; Urban Growth Areas; and zoning.
14. The 2004 Docket process began and eventually was folded into the 10 Year Future Land Use project. 90+ proposals were digitized and mapped.
15. The Buildable Lands program, administered by the Planning Division Demographics section relied upon PDS GIS for mapping and GIS data analysis support.
16. The Department of Public Works Transportation Planning group received significant mapping, data creation and update service, especially with the 10 Year Update project Arterial Plan element.
17. General reference mapping products were produced and maintained for department and public distribution.
18. Interdepartmental GIS data and mapping support was provided by PDS GIS. Projects include: Council District mapping; No Shooting Areas data and mapping; and a variety of locator maps for other departments.
19. The Shoreline Management Program Plan map conversion to GIS data and maps were initiated.

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20. The Transfer of Development Rights (TDR) program received data and display map products for the grant submittal process and County review.
21. Existing Park Districts and proposed park service areas mapping was prepared.
22. The SW County Municipal Urban Growth Areas study required mapping for display and publications geared for PDS and city staff, as well as the public.
23. The Critical Areas Ordinance study received a large amount of data analysis from PDS GIS team that was requested from and provided to the project consultant.
24. Compiled Open Space permit applications GIS data and provided display mapping for PDS staff.

S7B7 Intergovernmental Coordination

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 incorporations have occurred since adoption of the policies, primarily city/County boundary changes have occurred as a result of small annexations.

Several annexations were finalized at Bickford Road/Cemetery Creek drainage basin in Snohomish and Cedarholm in Stanwood and many other smaller parcels.

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. Reviewed parcels in 2003 using data from the Drainage DNR Report, to better assess locations for regional detention in the vicinity of the Mill Creek and Lynnwood areas.

- Develop sub area 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 Lake Stevens Sunnyside Plan was an example of this type of effort, the increased detention standards and continuous flow modeling is now required in this area.
- The following on-going GMA planning projects intended to respond to neighborhood and stakeholder interests are as follows:

Mill Creek East UGA plan (covers Penny and Tambark Creek drainage basins). Numerous development projects are now being built in this area.
Marysville/Lakewood plan (Quilceda/Allen drainages)
Southwest UGA and MUGA projects and potential integration of essential public facilities like the proposed King County DNR Brightwater Sewerage Treatment Plant, numerous meetings were held in 2003 to assess in the siting of this facility with special interest in protection of the Little Bear Creek system. Technical seminars were held throughout the summer of 2003 on this project.

- 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 (GPP)

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 sub-area plans for the UGAs. 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. Full implementation of critical area regulations which incorporate ESA stream protection measures also implements portions of the Natural Environment Chapter within the GPP. Sub-area plans for the Gold Bar, Snohomish, and Mill Creek UGA have been adopted. A sub-area plan for the Lake Stevens UGA was finally adopted in 2001 a historic event after years of discussion, debate and deliberation; a growth phasing overlay was a key element of adoption. Sub-area plans for the Arlington UGA, Marysville UGA, and the Penny Creek and Tambark Creek corridor, east of Mill Creek were finalized. The master plan for the Smokey Point area, addressing Quilceda/Allen watershed issues, will be prepared as a second phase of the UGA sub-area planning for Arlington and Marysville. This plan will require further work addressing a sensitive aquifer recharge area and potential measures for protection. The schedule for updating the current Critical Aquifer Recharge Area (CARA) ordinance was extended by state law to the end of 2004, although the County Council elected to update the Critical Area Regulations (CAR) on a more expedited schedule.

Portions of some UGAs that are subject to current or future interjurisdictional planning were 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, sub-area plans for the Gold Bar, Snohomish, and Mill Creek UGA have been adopted. A sub-area 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. Public Works completed the Drainage Needs Reports (DNR) in 2002 that required analysis across City/County jurisdictional lines to fully understand flows and impacts downstream. This DNR report was key to drainage plan review during 2003.

The office of financial management population forecasts/capital facilities update program continues to work closely with cities and sewer districts to assist in growth model predictions. These figures are continually updated as part of our 10 year comp plan update review and as part of our 2025 forecasting effort.

Interlocal Agreements Concerning Annexation Within Cities' Growth Planning Areas

Snohomish County reached agreement with the city of Monroe on a master annexation interlocal in August 1996. The agreement addresses coordination and transition of Public Works Surface Water Management responsibilities with Monroe in a designated surface water management area. The agreement addresses fees, 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-agreements between the County and Monroe.

Snohomish County is currently discussing similar master annexation interlocal agreements with Lake Stevens and Stanwood.

Other master annexation agreements that have been finalized are with the cities of Edmonds, Marysville, Arlington, Sultan, Snohomish, and Gold Bar. An earlier agreement was negotiated with the City of Everett for the Airport Road Annexation area.

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 SCC 7.53 and the state water quality standards as a basis of any agreements. The interlocal agreements are specifically intended to address issues related to annexations, which may include water quality issues. Note, based on several recent judicial decisions the total number of annexations received in 2001 - 2003 decreased from prior peak years, however recent legislation changes may increase this rate in the coming years.

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. During development, the addendum was discussed with Ecology staff, and a copy was sent to Ecology following adoption.

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 standards are implemented in accordance with the Stormwater Manual, the adopted Regional Road Maintenance Endangered Species Act Program Guidelines, County Drainage Manual and Snohomish County Unified Development Code Title 30, Subtitle 30.6, Environmental Standards and Mitigation, or with construction plans, for maintenance and construction projects. Proper implementation of ESC measures is monitored by Supervisors, lead workers and environmental staff who have been trained in ESC techniques and practices.

SURFACE WATER MANAGEMENT (SuWM)

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 projects 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 Management Manual

As a result of upstream development, citizens in the Sunnyside basin, west of Lake Stevens, expressed concerns over increased flows and subsequent down cutting of the floodplain. To this end, a volume control and continuous simulation model was developed and more stringent requirements for stormwater storage and release were accepted in 2003 by the County Council.

PDS reviews construction documents for drainage, erosion control and grading consistent with chapter 30.63A and 30.63B SCC. During early 2003, PDS completed reformatting of the various development codes. This is now called the

Uniform Development Code (UDC) and the new chapter for drainage is 30.63A, replacing Title 24 SCC; grading is chapter 30.63B replacing chapter 17.05.

On going training is occurring within PDS to stay current with upcoming revisions to the 1992 Manual and to learn the DOE "TAPE" protocols for treatment system selection. Certain County or other private projects have elected to comply with the 2001 DOE Stormwater Management Manual through the current Modification or Waiver process.

PDS Flooding Report

During the week of October 20-25th, Snohomish County braced for a severe 100 year weather event. Heavy rains, followed by high winds saturated the local soils. The convergence zone at the County line experienced precipitation levels ranging from 4.0 to 4.2 inches during a 24 hour period. In Everett, the precipitation levels were less severe, but in Darrington and the upper reaches of the Sauk-Suiattle River and both forks of the Stillaguamish, precipitation in excess of 12 inches in a 24 hour period fell. This heavy downpour caused significant channel migration in the Robe Valley as structures and County roads were washed away by the moving Stillaguamish River.

At least 208 single family structures were hit, flooded or impacted by these events. Per information received by Department of Emergency Management (DEM).

The timing of this particular October storm event could not have occurred at a much worse time in the fisheries cycle. Turbid waters and sediment loads were compounded by several major landslides in the Stillaguamish watershed. In addition, a PDS inspector found fish wash up or left totally stranded, displaced and dead after the flood waters receded. It is predicted that the impact to wild Chinook redds was significant.

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 (SWPPP) has now become an industry standard for many projects. Oversight of the full drainage plan review and construction plan approval process as well as all new work within the County right of way is conducted by a registered professional civil engineer. PDS provides training in ESC to construction inspectors and code compliance officers.

If field inspections show that approved drainage plans are not properly implemented, PDS is authorized under Snohomish County UDC Chapter 30.85 replacing 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 emphasis to a Voluntary correction and compliance process was made as a result of the rewrite of the Enforcement Procedures in Chapter 30.85.

In 2003, the Planning and Development Services Department established and described to the development community, a program of voluntary compliance; with an understanding that progressive enforcement actions would occur if measures were not being taken to preserve and protect critical areas, maintain water quality, follow the approved plans or take corrective measures requested by the design engineer or county inspector. This was the program initiated by Faith Lumsden, Director during her tenure as director of PDS. The verbal coaching or contact process appears to work in the majority of instances since measures are taken to correct the identified problem whether it is on the plans prior to approval or in the field after discussions with the inspector. It is PDS's position that tracking these types of verbal contacts is a meaningless exercise with little added value to the overall outcome of the project and may in fact be a counter measure given our current staffing. However, if these verbal directives were unsuccessful to correct or remedy an erosion control problem, a written Notice of Correction was provided to the owner/contractor. During 2003, 97 of these written Notice of Corrections were issued. This is what should be focused on, those parties whom after being told that they must correct a problem refuse to do so.

In addition, 11 of these potential violations were referred from SuWM/DPW to PDS inspection staff to seek a permit remedy or pursue enforcement since it appeared that the site may be causing a water quality problem. None of these sites were forwarded onto code enforcement for pursuit of a 7.53 violation or additional citation.

Another aspect of reporting that PDS has consistently reported on was the chronic grading violator. These cases are documented as complaints in 2003. Also, during 2003, the County council lifted the restrictions on wet weather grading activities as a result of a regulatory reform initiative, a concern for skilled grading operators who had lost their normal year round livelihood to part time unskilled laborers. Another factor in lifting the wet weather grading restrictions was the unseasonably temperate or dry weather that 2001 – 2003 displayed.

This weather pattern changed considerably in the fall and winter of 2003 as mentioned above. The first two major storm precipitation events were significantly dampened by the ability of the soil, wetland and dam storage systems like the Spada Lake Reservoir to store these first few heavy precipitation events.

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 5 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 Chapter 30.63A formerly Title 24, drainage, Chapter 30.63B formerly Chapter 17.05, grading and Chapter 7.53 Water Pollution Control. This group lost 1 position in 2002 due to budgetary constraints and a secretarial support position during an overall department wide reduction in force as well as losing some of the senior supervisory staff to retirements. This investigation and enforcement team will continue to provide an effective and timely response to complaints and investigations in a professional and courteous 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 erosion and sedimentation problems.

The history as of 2003 activity:

1481 total active files from 1998 through 2003 – grading/drainage complaints:

- 85 ongoing investigations (open)
- 55 Notice & Order (Administrative Enforcement/Appeals)
- 36 sent to Prosecuting Attorney
- 1305 closed

33 total active drainage complaints from 1998 - 2002:

- 2 ongoing NPDES investigations
- 31 closed

AIRPORT

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

The following activities were performed:

Northwest Territories Sewer Improvement Project – Sediment and Erosion Control inspections conducted by Airport Staff.

PARKS

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

During the reporting period all construction documents developed for Parks conformed with the requirements delineated in the Ecology Stormwater Management Manual. All contractors secured to work on Parks projects performed in accordance with the Manual.

The majority of park projects are designed and constructed by private contractors secured through the public bidding process. Construction permits are obtained through Planning and Development Services (PDS) who also are responsible through inspection for permit compliance. Many of the park projects also require permits from the Department of Ecology and other state, local and federal agencies. Some small capital projects are designed by private consultants and constructed by Parks maintenance employees. These projects also require permits and subsequent construction inspection 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

Construction of the Southwest Recycling & Transfer Station (SWRTS) was commenced March 17, 2003 with completion expected in summer of 2004. The old facility was demolished. Construction of the Airport Road Recycling & Transfer Station (ARTS) was completed and the Everett Recycling and Transfer Station (ERTS) was closed and demolished in November, 2003. Plans and specifications of both new facilities include requirements for runoff control and water quality in conformance with the Stormwater Manual and County drainage and construction standards. Design development includes Drainage Plans, Critical Areas studies and Erosion Control Plans. ARTS has, and SWRTS will have, NPDES Industrial Activity Permits for operation. The ERTS NPDES permit has been terminated.

S7B8b Existing Residential and Commercial Development Runoff

AIRPORT

Assessment and modification of existing Airport detention facilities.

Airport and Goodrich are working on a modification to a closure valve at the inlet to Wetland 25. Goodrich is the lead on the project. Anticipate upgrade by 4th quarter of 2004. Valve will no longer be manually operated. (Note: Design issues and electrical service has made this project more challenging than first anticipated).

The Airport hired Landau and Associates in the fall Of 2003 to sample the stormwater per our NPDES Permit.

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 did not reveal any need for modification of detention structures. Structures were found to be properly maintained and functioning. All new structures at the ARTS facility are functioning well.

SURFACE WATER MANAGEMENT (SuWM)

Capital projects to improve stormwater quality or mitigate stormwater effects

SWM funded the design and construction of two stormwater detention facility retrofits, and designed and constructed four additional projects that reduced erosion and improved water quality. These projects improve 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.

Bank stabilization and re-vegetation of sensitive areas

SuWM managed 26 Stewardship projects related to re-vegetation and bank stabilization of sensitive areas, in partnership with landowners. These involved elements such as technical assistance, design, invasive weed control, bank stabilization, large woody debris, animal exclusion (fencing and bridges), and native plant re-vegetation. Total area restored in 2003 exceeded 34 acres.

In addition to projects constructed by SuWM, staff provided advice, project resources and assistance to numerous other projects by landowners and local partner entities.

Livestock management projects

Several programs are currently underway to manage livestock in Snohomish County, the most important being partnerships with Snohomish Conservation District (SCD).

In 2003, the SCD conducted the following work on small farms with funding partially provided by SuWM:

- 83 acres of Brush Management
- 18,436 feet of fencing
- 23 acres of filter strips
- 3276 feet of Fish Stream Improvement
- 48 acres of Heavy Use Protection
- 306 acres of Planned Grazing Systems
- 22 acres of Range Seeding
- 68 Roof Runoff Management Systems
- 43 acres of Use Exclusion
- 17 Waste Management Systems

Technical Assistance/Information

Community Partners staff provided technical information or assistance to approximately 1,059 residents on a range of Best Management Practices (BMP) related to water quality, including: planting native vegetation, habitat improvements, runoff reduction, pollutant reduction, pet waste and more. Workshops were developed and conducted for streamside homeowners covering a range of BMP information. Informational materials (web-based and printed) were also developed in support of the streamside BMP emphasis. Mailings were sent to 16,000 streamside property owners with additional information to follow in 2004.

Native Plant Program

The Native Plant Program volunteers salvaged over 2,300 native plants from development sites throughout the County. In addition volunteers containerized 12,000 bare-root native plants purchased from area nurseries for future plantings. Volunteers contributed over 6400 hours of service to the program and the County. Plants were stockpiled at the Lake Stevens Native Plant Holding Facility and Nursery for later replanting on riparian restoration projects. The program responded to 116 requests for technical information regarding native plants, riparian and wetland plant communities, and restoration.

The Native Plant Program provided plant materials and technical support for numerous watershed steward and CIP river habitat stream buffer plantings in the Snohomish, Stillaguamish, and Sammamish River basin accounted elsewhere in this report. Over 10,000 native plants left the nursery for these projects.

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. The class had strong emphasis on riparian and wetland communities highlighting the function and contribution native plants make to water quality and quantity. Native Plant Stewards returned over 1500 hrs to County projects in 2003.

S7B8c Municipal Storm Sewer Operation and Maintenance

ROAD MAINTENANCE (RM)

Maintenance of catch basins, pipes, and open ditches

During the period from January 2003 through December, 2003, 5,793 catch basins were cleaned. Approximately 21 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 has increased the accomplishments in this area. Other efforts to increase productivity in this area are underway. Plans for construction of the vactor grit decant facility at the Arlington shop were completed and the construction bid was awarded to a building contractor. Construction of the decant facility will be completed by the summer of 2004. The use of catch basins and stormwater ponds for the decant of vactor liquid continues to be explored. Field decant of the catch basin liquid will expedite the cleaning of our stormwater systems and result in our ability to better achieve the goals of the 2001 Manual, and improve water quality treatment. Several field decant sites were selected for further review, that appear to be in compliance with the 2001 Stormwater Manual. More sites will be identified for review and possible use during 2004. Vactor grit continues to be disposed of through Snohomish County Public Works Solid Waste Division.

Ditch maintenance during the same period consisted of cleaning approximately 50 miles of ditches using either a Ditchmaster or backhoe, 1,080 lane miles of roadside brush-cutting and 12,164 lane miles of road shoulder 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.

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 2003 to December 2003 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 seasonally. The vactor grit from Parks facilities, and sludge from solid waste facilities, is disposed of through Snohomish County Solid Waste.

SOLID WASTE MANAGEMENT (SoWM)

Vector waste decant facility O/M

Operation of this facility continues with vector waste accepted from County, WSDOT, the City of Mill Creek, the City of Brier, the City of Kirkland and three private vactoring firms. The total tonnage brought into the facility for 2003 was 2,628 tons for an average of 219 tons per month. This is a significant increase over 2002.

Vector grit from non-contaminated spoils was handled thru the extension of a contract with Snohomish County Roads department vendor, Aspen Environmental. This contract allows the material to be used for daily cover at the Rabanco landfill in Eastern Washington. The contract has Aspen Environmental pick up the material at our facility, maintains a low disposal rate and allows us to keep all material as one waste stream, which saves on handling time and storage space. 100% of our material is recycled.

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 vacuum storm and sewer catch basins at three County transfer stations and annually at Cathcart Landfill facility. The Temporary Transfer Station was opened in March 2003 (open while SWRTS is closed) and routine vacuuming has been accomplished there as well. The wet season inspections did not reveal inadequate cleaning periods or deficiencies requiring repair. In September 2003, 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

Airport performs regular maintenance on its stormwater conveyance system. Maintenance includes detention pond maintenance and cleaning of system.

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, 2003 through December, 2003 was 3,144 tons. For comparison purposes, during the same period in 2002, 2,738 tons of sand was applied. Approximately 9,000 tons of sand was applied 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 to 2002 application 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. During the 4th quarter of 2002, RM purchased equipment for the application of liquid anti-icing solution. Presently Calcium Magnesium Acetate, or CMA, is used for this purpose. RM plans to use CMA primarily as an anti-icing strategy. However, the product may also be used as a de-icer to assist with snow and ice removal. CMA has been found to be effective at preventing the formation of ice on pavement. It has also been found to be environmentally sound and can significantly reduce the amount of sand used during snow and ice events. Two additional applicator trucks were purchased in 2003, for a total of 4 CMA applicator units.

Sweeping

The Division purchased three more vacuum sweepers during 2003, as replacements for existing mechanical sweepers. During the period January, 2003 to December 2003, approximately 7,422 lane miles were swept. The fleet has increased from four mechanical sweepers in 2001, to six vacuum sweepers in 2003, making sweeping more effective and increasing production. Sweeping is now done on a more routine basis than in past years, benefiting water quality.

RM has two facilities with prefabricated structures in which to store sweepings. These are picked up and disposed of by a vendor. One building is located at the Arlington shop, the other at the Cathcart facility. Both are currently in use for temporary storage of sweepings.

Wooden bridge deck repair

During the period January, 2003 to December, 2003, the RM division continued using bridge members treated with State-approved wood preservative. Existing supplies of creosote treated wood are being depleted, and continue to be used on a limited basis. 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. 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 guardrails. Guardrail posts are treated with 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.

Asphalt patching

Asphalt patch 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 newer 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 known potential impact on water quality from the process may be the particles that result from wear of the product as traffic runs over it. Frequent sweeping may 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 older two-part epoxy products are no longer used. The new equipment recycles its clean-up waste. As a result there are minimal 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. WSDOE protocol is used when hazardous materials are encountered in the right-of-way.

Asphalt / bituminous surface treatment

A new paving machine was purchased in 2003. This machine is outfitted with a containment system for waste by-products, and utilizes an electric heating system which produces no emissions and reduces the amount of diesel fuel used by this machine. In 2003, 134 miles of road were re-surfaced

All excess asphalt, as well as asphalt removed during excavation operations, is recycled. In 2003, an asphalt pulverizing attachment for backhoes was purchased. This machine increases the ability to recycle asphalt in road maintenance, decreasing the need to dispose of this material in landfills.

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 2003 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 125 miles of gravel roads by paving with asphalt concrete pavement or bituminous surface treatment, reducing the inventory of gravel roads to less than 10 miles.

S7B8e Water Quality Consideration in flood management projects

SURFACE WATER MANAGEMENT (SuWM)

Levee design, maintenance, and operation

SWM spent \$280,000 in 2003 on projects to repair flood related damages to County roads and bridges, maintain levees or construct river stabilization projects to protect County roads and bridges. Practices were in accordance with the approved Stormwater Management Program. No new levees were built in the reporting period. Regular inspection, maintenance and vegetation control were performed or scheduled on 27 County-owned structures. Levees were reseeded for erosion control where appropriate.

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 fertilizers by County employees

Application of pesticides and fertilizers by Parks employees continues to be in compliance with the approved NPDES Program. The Parks Habitat Steward, hired in 2001, has primary responsibility at Parks for vegetation management, including pesticide/fertilizer application and noxious weed control. Rangers and maintenance staff do not apply pesticides. Fertilizer application is closely monitored and controlled using natural products where feasible with an emphasis on minimizing runoff.

Parks completed a draft of an Integrated Vegetation Management (IVM) policy for Parks-owned public park lands. The policy offers specific strategies for weed and pest control, including noxious weeds, at specific park properties.

ROAD MAINTENANCE (RM)

Application of pesticides and fertilizer by County employees

Snohomish County Road Maintenance uses no pesticides or herbicides for routine 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 2003. Pesticides are not being used. All chemicals are being kept in covered storage areas away from precipitation and storm drainage.

S7B8g Illicit Storm Sewer Discharge Elimination

SURFACE WATER MANAGEMENT (SuWM)

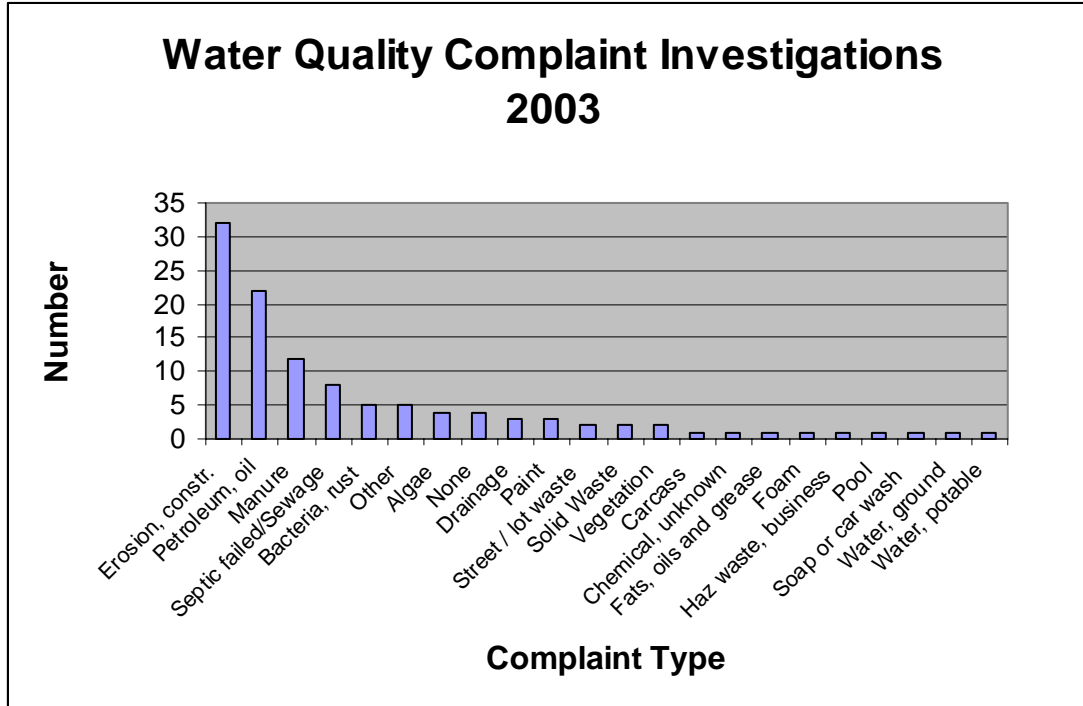
Illicit discharge elimination program enhancement

Streamlined data management and the use of a field laptop increased field efficiency and enabled staff to complete dry weather outfall screening 45 days earlier than the previous year. Samples were taken at over 50% of the outfalls visited.

Water quality complaint investigation

As discussed in Section S7B3 – Legal Authority, Snohomish County adopted the Water Pollution Control Ordinance -Snohomish County Code Chapter 7.53 (SCC 7.53). SuWM staff have assisted the Code Enforcement section of PDS in their development of policies and procedures for enforcement of the ordinance. SuWM 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 staff are turned over to PDS Code Enforcement staff, who decide whether to proceed with an official enforcement action.

In 2003, SuWM responded to 114 complaints of varying types, indicated in the graph below.



The most commonly received water quality complaint in 2003 was erosion from construction sites. The category of construction erosion is all-encompassing and includes such complaints as gravel pit turbidity, erosion due to concrete work, simple excavations for culverts and commercial or residential construction sites.

In 2003, 11 cases were referred to PDS construction inspectors where water quality was being threatened by construction site activity. In all eleven cases, the contractors/owners worked with PDS inspectors to remedy the problems before a third violation of SCC 7.53 was documented.

Two cases were referred to PDS Code Enforcement for violations of SCC 7.53: one in which paint products were illegally dumped, and another in which SuWM has documented elevated levels of fecal coliforms being discharged into the County storm sewer.

The second most received complaint for 2003 was for the discharge of petroleum products. Ninety percent of these complaints refer to localized complaints where citizens had been improperly storing or disposing of automobile fluids, or simply had a vehicle in need of repair. In these cases, technical assistance or education was provided to remedy the problem. In addition, Snohomish County Road Maintenance is often called upon to assist in cleaning up spilled product within the County right of way. Two oils spills occurred in 2003 which demanded an involved response from SuWM.

The first of these spills occurred at 12:15 AM on December 30, 2003. The U.S. Coast Guard was informed of an oil spill which took place when a Foss Maritime Tug was taking on bunker fuel at the ChevronTexaco marine terminal at Point Wells. Snohomish County water quality representatives were notified of the spill at noon on December 30 from a City of Seattle representative. Assistant On-Scene Coordinators for the Department of Ecology were immediately called for an update and to ask if a representative from the County water quality unit was needed. The County was informed that the National Resource Damage Assessment team, Coast Guard, Environmental Protection Agency, and several other agencies were on site and that the Incident Command Structure was being implemented. County water quality staff continued to get updates on the spills trajectory and potential impacts to surface waters of Snohomish County. The majority of the impacts were seen on Point Jefferson in Kitsap County where the oil entered the Suquamish estuary.

The second large petroleum product spill occurred at 10:30 AM on June 12, 2003. SuWM was notified by Snohomish County Road Maintenance that a diesel spill had occurred on 128th St. SW and Admiralty Way in the Swamp Creek Sub-basin. SuWM immediately notified Assistant On-Scene Coordinators for the Department of Ecology who were both onsite when SuWM arrived at 11:10 AM. Other agencies present included the Snohomish County Department of Emergency Management and representatives of Puget Sound Truck Lines from which the diesel spill originated. Approximately 90 gallons of commercial grade diesel fuel spilled from the tractor truck when it was struck by a second vehicle. The diesel spilled onto Admiralty Way, entered the County drainage system and flowed approximately 280 feet north to south before discharging into a native growth protection area (NGPA) on the east side of Admiralty Way.

Although not present when SuWM arrived, Snohomish County Fire District #1 and the Sheriffs Department were the first to arrive at the scene. The fire district contained the diesel before it entered the NGPA. In addition, the fire district inserted absorbent pads into the catch basins where the diesel product settled.

By 12:01 PM Emerald Services who was contracted to Puget Sound Truck Lines was onsite and attempted to clean the roadway and County drainage system. The equipment used by Emerald proved to be inadequate and at 2:35 PM, a second contractor, Rivers Edge was onsite with appropriate equipment to continue cleaning out the drainage system. At 4:45 PM the drainage network and roadway was cleaned of diesel. A final inspection conducted at 6:30 PM found that a small 1ft x 1ft area of the NGPA had received diesel. However, overall the response succeeded in minimizing impacts.

Responsible party letters were sent to Puget Sound Truck Lines by the Department of Ecology and Snohomish County reiterating the importance of having spill kits inside the vehicles and appropriate spill notification procedures in place.

In cases where the improper storage or disposal of manure is occurring, SuWM conducts site visits to determine direct or measurable impacts to water quality. A total of 12 cases related to manure management were investigated in 2003. SuWM works with the Snohomish Conservation District and the responsible party to implement farm best management practices to minimize real or potential impacts to water quality.

SuWM received seven calls in 2003 related to potentially failing septic systems and illicit connections to the County drainage. SuWM conducts site visits to photograph and sample the drainage network for evidence which links a failed septic to a specific residence or group of homes. SuWM works with the Snohomish Health District (SHD) which under Washington State Administrative Code (WAC 246-272-16501), requires the repairing or replacing of failing onsite sewage disposal systems. Dye tests are often performed by SHD in the toilets or washing machines at suspected residences to further pinpoint a responsible party. If an illicit connection via failing septic system is found, the SHD issues a 30-day correction notice which mandates the septic system be repaired or replaced by a licensed waste water treatment designer or engineer. Should these actions fail to gain compliance, and further violations of SCC 7.53 are documented by SuWM, the case is then sent PDS Code Enforcement for further action.

An investigation which began in 2002 resulted in the SHD sending a notice of correction in April 2003 to a responsible party who was found to have an illicit connection of a septic system to the County drainage along 148th St. SW in the Swamp Creek Sub-basin. The investigation resulted in five residents being identified as potential contributors to elevated levels of fecal coliforms found in Swamp Creek. As of November 3, 2003 three of the five residents have connected to the sanitary sewer. The other two are in the permitting process. Two rounds of sampling after construction was completed have returned low fecal coliform counts. The remediation of these illicit connections will lower levels of fecal coliforms and harmful chemicals being discharged into Swamp Creek.

A second illicit connection from a failing septic to the County drainage was removed in 2003 through a coordinated effort between SuWM and the SHD. Photographic evidence taken along 67th Ave. SE in the Snohomish Estuary Sub-basin provided enough information for the SHD to issue the responsible party a 30 day correction notice. The removal of the connection pleased the downstream complainant and ensures a lower level of pollutants reaches the Snohomish River.

Development of illicit discharge elimination program

Improvements to both the water quality complaint response and dry weather outfall screening programs continue to be made. Program modifications improve data collection, database management, enforcement, and reporting.

To help facilitate investigations and dry weather outfall screening, SuWM has an ongoing permit to work in the Washington State Department of Transportation right of way.

Complaint Investigation

Staff of SuWM's water quality group respond to citizen complaints where threats to water quality are believed to exist. As stated previously, the three most commonly received complaints for 2003 were related to construction site erosion, incidents involving petroleum products, and mismanagement of manure.

Water quality Investigations for the determination of illicit discharges stemming from failing septic systems has been enhanced due to the use of optical brightener monitoring. Optical brighteners are a complex mix of chemicals used in laundry detergents, and are designed to adhere to vegetable matter (i.e. fabrics), which make your whites appear brighter.

The optical brighteners are not easily broken down in septic systems and hence persist in surface waters in the event that a septic system is failing. A brightener free fabric pad is strategically placed downstream of a suspected source, retrieved after one week, dried and placed under a black light. If the fabric fluoresces, as compared to positive and negative controls, we can safely assume that brighteners used in laundry detergents are present in the surface waters. For quality control of our in-house screening, positive fabric pads and a % of the negative test results are sent to a lab for a quantified confirmation of the presence of brighteners. SuWM used optical brightener monitoring to confirm the existence three illicit discharges in 2003. One discharge was occurring due to improper handling of recycled materials, and the other two resulted from failing septic systems.

Dry Weather Outfall Screening

As part of the County's approved NPDES permit, SuWM developed a dry weather outfall monitoring program based upon "Investigation of Inappropriate Pollutant Entries into Storm Drainage Systems – A User's Guide" (Pitt et. al., 1994; EPA/600/R-92-238. Dry weather outfall screening has been conducted by SuWM staff during the spring and summer months since 1998. The goal is to detect and trace illicit discharges of polluted water, entering the County drainage system. For 2003, SuWM streamlined data gathering and management through the development of a Microsoft Access based database which acts to parse and populate tables with downloads from field equipment. The process has assisted in quality control of field data, and synthesis for reporting.

The use of a Microtox™ test previously used to determine the general toxicity of waters to luminescent bacteria (*Vibrio fischeri*) was discontinued for 2003. The costs associated with the number of previously positive results outweighed the tests usefulness.

Since 1998, a total of 601 outfalls have been visited, with 50% of those having been sampled for a variety of parameters. At each outfall, a Trimble Pathfinder Pro XR Global Positioning System™ (GPS) was used to gather sample locations, pipe size, material, azimuth and other structural information. In addition, a Hyrdolab™ multi-parameter water quality instrument was used to gather temperature, pH, conductivity, and dissolved oxygen.

In 2003, 100 outfalls were visited and samples were collected for water quality at 62 of those. The outfalls visited in 2003 were chosen based upon the sample results gained from 2002 when a single parameter or two parameters fell outside of the acceptable limits noted in Table 8. As indicated, 61% of the samples for dissolved oxygen fell outside the acceptable limits, while 25% exceeded 1mg/l for total nitrogen, and 23% exceeded the limit of 18°C for temperature (Table 8). High summer temperatures and stagnant waters can describe many of the low dissolved oxygen results.

Land use plays a large role in the quality of waters. Urban land uses within Snohomish County include, high, medium and low density residential, commercial and industrial areas. These areas are primarily located in the south County in built environments and therefore contain a higher density of outfalls/square mile than other land uses. As a result, the urban areas have been sampled more frequently. In 2003, water quality results in urban areas accounted for 42% of those falling outside of acceptable limits for all parameters. Residential land uses, which includes, rural, 5 and 10 acre areas accounted for 26% of the parameters falling outside of acceptable limits. Many areas have been classified as having an unknown land use, and these outfalls made up 22% of the total having unacceptable results. The remaining 10% of outfalls having unacceptable results fell within the land uses of river-way commercial farmland, undefined, and those inside cities. Information such as this combined with further GIS analysis can be used to drive development standards and the use of best management practices to ensure water quality is considered and protected.

Snohomish County, Washington
 NPDES Municipal Stormwater Discharge Permit
 2003 Annual Report

Table 8 – Dry Weather Outfall Monitoring Summary 2003

Parameter	Units	Limits not to exceed	Measured Minimum	Measured Maximum	Total # of Samples	Percent Samples Outside Limits
Temp ¹	°C	>18	10.71	26.65	62	23
DO ²	mg/l	< 8.0	1.36	13.21	62	61
Cond. ³	umhos/cm	> 250	14.9	628.2	61	32
PH ⁴	Units	<6.5 or > 8.5	6.23	8.1	62	1
Turbidity ⁵	NTU	>30	0.65	40.8	62	3
Nitrates ⁵	mg/l	>1	.01	21.2	62	25
Fecal Coliforms ⁶	Colonies/100ml	>1000	0	19,000	62	16
MBAS ⁷	mg/l	>.06	0	.627	62	19
Flouride ⁸	mg/l	>1.0	.04	.672	62	0
Hardness	mg/l	None	11	292	62	0
Copper ⁹	ug/l	>15.25	.40	27.6	62	4
Lead ⁹	ug/l	>56.87	0	21.5	62	0
Zinc ⁹	ug/l	>103.7	2.2	319.7	62	5

¹ Temperature: Limit based upon WAC 173-201A for class A waters

² Dissolved Oxygen: Limit based upon WAC 173-201A for class A waters

³ Conductivity: No state water quality standard exists, based upon SWM mean ambient water quality data.

⁴ pH: Limit based upon WAC 173-201A for class A waters

⁵ Nitrates: No state water quality standard exists.

⁶ Fecal Coliform: Based upon SWM complaint investigation results for failing septic systems, and the Snohomish Health Districts action level.

⁷ MBAS (Methyl Blue Active Substances): Based upon research by Pitt and Lalor 1993.

⁸ Flouride: Based upon research by Pitt and Lalor 1993.

⁹ Washington State fresh water acute metals criteria based upon conversion factor from total recoverable metals to dissolved metals of 0.96 (Stephan 1995) and a mean hardness of 90 mg/l found from all outfalls (n=62) sampled in 2003. Minimum and maximum metals were sampled as total recoverable and converted to dissolved metals levels using a conversion factor of 0.96 (Stephan 1995). Aquatic life criteria determined by the USEPA are for dissolved metals.

Spill response coordination with other agencies

Water quality investigators coordinate with Snohomish County Department of Emergency Management and Ecology on spill response. As documented under the water quality complaint investigation heading, SuWM coordinated with those mentioned on two oil spills during 2003.

AIRPORT

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

Goodrich had a couple illicit releases from Hangar 3. Cleanup was monitored by Airport and Department of Ecology.

Inspection/modification of activities and facilities at tenant properties.

Inspections were conducted at: BF Goodrich, Airport Maintenance and all aviation ramps.

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.
Airport now has an operational deicing pad for wide body aircraft.

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

The Airport hired Landau and Associates in the Fall Of 2003 to update the Airport Spill Control Plan.

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.

In December 2003, PDS/CE issued a water pollution control citation to polluter known to have discharged elevated levels of fecal coliforms and optical brighteners to the County drainage in the Little Bear Watershed. The case is currently under review by the Prosecuting Attorney's office.

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

As stated in Section S7B3 and S7B8a of the program, the County adopted the 1992 Ecology Stormwater Management Manual with an addendum in September 1998. The County planned to develop its own manual, but the timing on this document production was put on hold pending resolution of potential use of the recently published 2001 DOE Stormwater Management Manual. PDS uses this manual as a guidance document, but may allow its use if the applicant requests to use it through the waiver and modification process, 30.63A.250. Source control containment is a typical requirement that is followed for certain types of projects.

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.

Spills and Spill Response

The two most notable spills/response were a large tanker fire near Scriber Creek in Lynnwood/WSDOT R/W and the barge spill in December at the Point Wells/Chevron site. Snohomish County PDS deferred incident command to DEM, the US Coast Guard, DOE and EPA for this cleanup operation, since this was not deemed a land development activity.

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 continue to be in accordance with the approved Program.

Spill response coordination with emergency response agencies.

Practices continue to be in accordance with the approved Program. The emergency action plan for the Evergreen State Fairgrounds, completed in 2001 with the cooperation of the Snohomish County Department of Emergency Management, was implemented in 2002. 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 at facilities are routinely cleaned and the filters are changed as needed by RM and Equipment Rental and Revolving (ER&R) staff. 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 solid waste from contact with storm runoff at Solid Waste facilities. Waste receiving areas are frequently cleaned and washed to minimize material being tracked off site.

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 collection areas at the new Transfer Stations are designed with central drainage to a blind sump and are covered to prevent rain contact with auto waste. This covered, blind sump drainage feature is also provided at NCRTS and TRTS. New Spill Kits are provided at the stations when they open for service.

During 2003 all the unsupervised rural recycling sites were closed and the containers decommissioned. All Snohomish County recycling is now at supervised enclosed facilities with trained site attendants who clean and inspect for any spillage. New 50 cubic yard drop boxes were placed in service with seven each at NCRTS and ARTS while TRTS and the five drop boxes received two each. The drop box containers have windows for the appropriate recyclable materials with coverings to prevent spillage. The container lids are sheet metal and do not open for customers requiring all access through the windows. Stationary compactors were placed in service at NCRTS and ARTS for compaction of OCC (Old Corrugated Containers) with attendants receiving training on proper operation. Attendants are trained to always inspect the contents of the containers before consolidating loads or any other activity with the material. Improper materials, whether contaminants or hazardous, are removed and placed in the proper container.

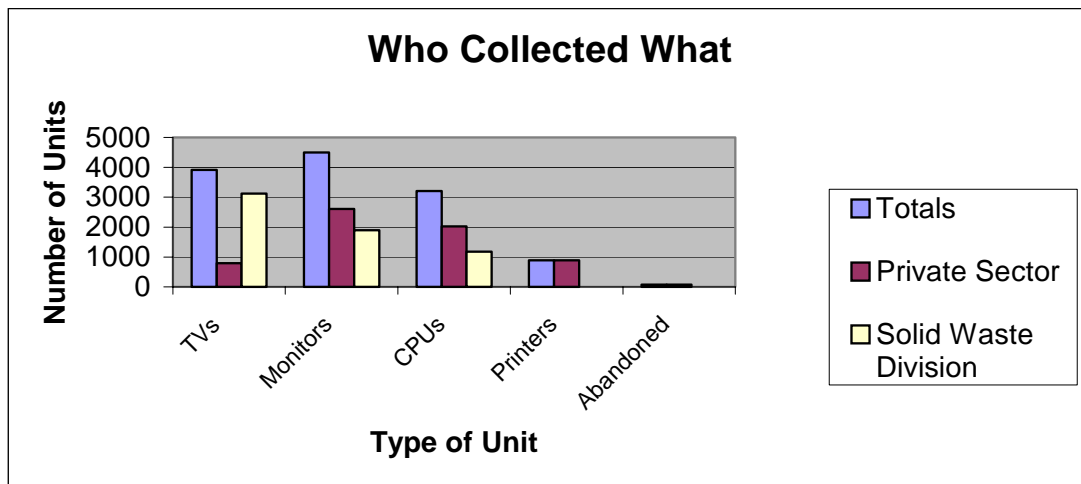
Training for the scrap metal program focused on safety aspects with particular attention on not accepting used propane tanks in the scrap metal box. Any tanks received are collected separately in a specific container for proper decommission. Signs were placed to reinforce safety aspects of the Scrap Metals program.

For 2003, the County continued collection of cathode ray tube and other electronics equipment that have been banned from landfilling. This reduces the potential for lead and other toxic metals from leaching into the environment. A summary of the collection effort is shown below:

Collection continued at NCRTS (pilot site in 2002) and was added at TRTS in March and the new ARTS facility in October.

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

The team formed to accomplish cleanup and retrieval of illegally dumped material from road Right of Way, park property, Forest Service property and other public lands continued its work in 2003. Illegal dumping can result in contamination of the environment and impacts to stormwater, because favorite dumping sites are often drainage gullies and small streams. Material cleaned up can range from litter to tires to appliances to vehicles. Toxic waste originating from the manufacturing of illegal drugs is also collected. The project was started in 2001 and now continues as an ongoing effort. In 2003, 536 sites were cleaned up, resulting in proper disposal of 486 tons of trash and appliances and recycling of 216 vehicles.



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 2003, 3,753,089 lbs of hazardous waste were diverted from municipal solid waste and waste water systems in the County and safely disposed. Fifteen thousand one hundred sixty eight families delivered household hazardous waste to the County's facility in 2003.

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, dry cell 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. Two hundred four thousand three hundred ninety eight gallons of motor oil, 9,981 gallons of antifreeze, 41,526 lbs of oil filters, 309,675 lbs of lead acid batteries and 25,778 lbs of fluorescent lamps were recycled in 2003.

Three hundred twenty two Small Quantity Generators dropped off 97,226 lbs of hazardous waste at the MRW Facility. Solid Waste Staff personally visited with 278 small businesses and talked directly with the manager or owner about solid and hazardous waste practices. Local agency staff will follow up to continue assisting these businesses with the changes to recycling and hazardous waste management.

The electronics recycling service at the County's transfer stations now provides options for disposal of lead-bearing cathode ray tubes for the public and businesses disposing of TV's and computer equipment.

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 personnel at the Moderate Risk Waste facility are also available for advice in the event of a spill or emergency.

S7B8h Industrial stormwater monitoring and control

SURFACE WATER MANAGEMENT (SuWM)

Inventory of Industrial facilities

The use of Ecology's facility site query at <http://apps.ecy.wa.gov/fs/fsstart.html>, combined with Metroscan and Arcview enables water quality investigators to develop a database with names, location, SIC code and permit type of industry. The addresses for each facility are geocoded and plotted over orthophotos. Complaint response and business visits are then better prepared to spatially identify potential sources of surface water pollution.

Industrial Stormwater Monitoring

SuWM responded to 41 complaints where business was reported to have impacted water quality. These included 17 building contractors, 5 trucking companies, 3 gas stations, golf courses and several others of varying standard industrial classification codes.

SuWM's case against Waste Management (WM) Northwest division is the most high profile of all cases dealing with industrial stormwater. In May of 1999, SuWM received a complaint that the County ditch on the northeast corner of 234th St. SE and 63rd Ave. SE appeared to be polluted. In response, SuWM determined that discharge emanating from WM's Woodinville, facility located at 6211 234th St. SE 98072, to be responsible. Since May 11th 1999, SWM has made several site visits to the point of compliance and taken water samples which indicate violations of SCC 7.53.070. Most noteworthy are documented violations of 7.53.070 (a) where results for fecal coliforms have reached as high as 3,000,000 colonies per 100 milliliters (ml) of water and the geometric mean has been calculated to be 14,515 colonies/100ml. The standards in Washington State Administrative Code WAC 173-201A-030 for the class AA receiving waters of Little Bear Creek, including all feeder streams, states that fecal coliform levels shall not exceed both a geometric mean value of 50 colonies/100ml and not have more than 10 percent of all samples obtained for calculating the geometric mean value exceeding 100 colonies/100ml. In the case of the discharge from WM, seven of the eight or 87.5 percent of the results used for calculating the geometric mean have exceeded 100 colonies/100ml.

Since the initial sample results were received, SuWM along with Ecology and the Snohomish Health District have all provided WM with technical assistance to remediate the problem. However, on September 3rd of 2003, SuWM gained photographic evidence to suggest that the most simple and cost effective source control best management practices were not being employed. Further sampling for fecal coliforms and optical brighteners (used in laundry detergents) on September 17th, 2003 indicated that WM continued to violate SCC 7.53 for discharges of process waste water that contained elevated levels of fecal coliforms and optical brighteners. At this point, SuWM required a mechanism to gain compliance and forwarded the case to PDS Code Enforcement for further action. On December 8 2003, PDS Code Enforcement issued WM with a water pollution control citation, which is currently under review by the Snohomish County Prosecuting Attorneys office.

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

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

Method for referring industrial problems to Ecology

As mentioned above, SuWM water quality investigators worked with Ecology staff from the Northwest Regional Office on many occasions during 2003. In total, 3 cases were officially referred to Ecology. One dealt with construction site erosion control, and the two others related to spills of paint and oil. During much of 2003, Ecology was searching for a new water quality inspector to coordinate with SuWM. In the meantime, SuWM continued to coordinate with the head of Ecology's water quality unit and others for joint investigations.

AIRPORT

Stormwater monitoring at the Airport

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

PLANNING AND DEVELOPMENT SERVICES (PDS)

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.

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 permitted sites as required by the new Industrial Discharge Permits and by other agencies (SHD and/or municipal requirements). A total of eighty-two (82) stormwater samples were analyzed.

S7B8i Education

PLANNING AND DEVELOPMENT SERVICES (PDS)

Employee Education

The Planning and Development Services staff completed several workshops and training seminars during 2003 subsequent to implementation of the drainage and grading ordinances. The training sessions emphasized how important the staff's role is in inspecting stormwater pollution.

Beneficial uses such as fish usage of streams and wetlands, swimming and maintenance of clean drinking water supply were emphasized. By being better informed, staff make quality decisions about whether or not a particular activity

would degrade water quality via stormwater runoff. The staff were empowered to make these field decisions if violations of SCC 7. 53 were being created.

Training sessions are occurring in-house within PDS. Clearly, additional resources in the training effort would improve effectiveness. In the interim, the County again partnered with Edmonds Community College on two occasions last year to get the DOE/County erosion control, NPDES Stormwater Regulations, BMP's and Low Impact Development message out to the contracting and building community.

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

Parks has nearly completed a process that will standardize maintenance practices at all Snohomish County Parks. Maintenance personnel and park rangers have received continuing reinforcement regarding spill response and stormwater pollution prevention.

The Parks Habitat Steward received continuing education and training regarding pesticide application including application in aquatic conditions. The Steward also shares information with rangers and maintenance personnel regarding her role in vegetation management, pesticide/fertilizer application and noxious weed control.

Parks maintenance personnel and rangers will receive continuing training in 2004 from technical and professional staff from the Snohomish County Surface Water Management Division regarding drainage systems maintenance.

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 was 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 administers the training program. The University of Washington developed the training curriculum. Snohomish County Road Maintenance will have all road workers trained in the implementation of BMPs under this program. In 2002, approximately 60 Road Maintenance employees attended four training classes in Endangered Species Act education and BMP application. In 2003, 15 road maintenance staff received training in the use of BMPs. Road Maintenance staff will continue to be trained in these practices. A hazardous waste response team has attended the *Hazardous Materials Training* program and can assist in proper response for the clean up of hazardous materials spills.

The Division also initiated and carried out a series of lead worker training classes. Subjects included environmental regulations, BMPs, and their environmental responsibilities as leadworkers.

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.

During the spring and summer, regular bi-monthly staff meetings were held with WDFW Area Habitat Biologists. At these meetings, the maintenance activities of culvert replacement, ditch cleaning, and shoulder repair were presented and received HPA approval. Discussion topics include work timing, water quality best management practices, culvert enlargement for fish passage, and additional mitigation measures. In the fall and winter months, particularly during the record flood events of October and November, the division communicated weekly, and met in the field, with WDFW staff to receive HPA approval for urgent road embankment and subgrade repair, culvert and bridge replacement and maintenance.

SOLID WASTE MANAGEMENT (SoWM)

Employee education

Walk-through refresher training was conducted for site managers during the 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 has been incorporated into training for Operations staff members. Transfer station staff and site maintenance personnel receive this training

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. 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, Transfer Stations and Drop Boxes, schools, libraries, and cooperatively with other cities and agencies.

The County's 14 school districts were offered technical assistance to reduce use of chemicals on school grounds. In addition, a "natural grounds-keeping" workshop was held for 40 professional landscapers from the County, school districts, cities, parks, and colleges.

A compost bin sale was held, resulting in the sale of 2,916 bins to County residences.

Small Quantity Generator (SQG) education

Three hundred twenty two SQG's disposed of their hazardous waste at the County's Moderate Risk Waste Facility in 2003.

Twenty EnviroStars businesses received renewal visits in 2003, maintaining their participation in the program. The program added 16 new businesses this year, primarily dry cleaners. The EnviroStar program has been phased out for 2004,

with all stores retaining their certification. Efforts will be focused through the SQG programs.

Outreach

The consultants (Cascadia) and County staff conducted initial on-site technical assistance and follow-up visits to 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:** Solid Waste staff conducted renewal visits to 20 EnviroStars businesses.
- **New EnviroStars:** The County qualified 16 new EnviroStars during this time period, for a new total of 68 Snohomish County EnviroStar businesses. One business, Magna Design, upgraded from a four-star to a five-star rating by significantly decreasing solid waste generation by 50% and increasing wood waste recycling through improved sorting and adding an environmental intern.
- **Success stories:** The County PIE staff wrote and distributed 16 new EnviroStars success stories for publication in local media as well as the County Website.

SURFACE WATER MANAGEMENT (SuWM)

Employee Education

The following educational presentations were given to SuWM employees.

<u>Date</u>	<u>Topic</u>	<u>% related to water quality</u>
1/7	DNR Wrap-up report & briefing on the next phase, Gregg Farris	33%
2/4	Phase II NPDES Permits, Bill Moore, Ecology	100%
3/4	West Nile Virus Management Strategies, Bill Leif	33%
4/1	Stilly Estuary, Kip Killebrew	33%
5/6	Puget Sound Action Team Initiatives, Hilary Culverwell, PSAT	100%
8/5	SWM Budget and 2004 Work Plan, Joan Lee	33%
11/4	The Bob Drewel Legacy	20%

Public education conducted during other SuWM activities

SuWM education and public involvement staff responded to approximately 2,949 requests (telephone, email, and personal site visits) from citizens wanting educational or technical information. The average contact and follow-up time was about 30 minutes and is estimated at 1,475 hours.

SuWM Web Pages received more than 120,179 visits from 50,718 unique visitors during 2003. The monthly median visit length ranged from 1:32 minutes in April to 4:17 minutes in Dec. In all, the public spent 5,513 hours viewing SuWM web pages.

General Public Education

Watershed Keeper Series

3/13-5/15/03 Watershed Keeper Class - a total of 17 citizens participated in this 10-week (44-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. (748 contact hours)

Citizen Workshops

Six workshops (each about 3.5 hours in length) were conducted for streamside landowners. The workshops addressed all issues related to stream stewardship, including preventing and reducing pollution. 123 people attended these workshops. (430.5 contact hours)

<u>Date</u>	<u>Topic</u>	<u># of Participants</u>
3/29/03	Working in Streams, Monroe,	15
4/5/03	Working in Streams, Arlington,	25
4/12/03	Working in Streams, Lake Stevens	18
5/3/03	Home Wildlife Habitat, Mill Ck	22
5/10/03	Home Wildlife Habitat, Monroe	28
6/14/03	How Streams Work, Lake Stevens	15

Three 90-minute workshops were held to train 66 Salmon Watchers (9/10 in Mill Creek, 9/17 in Monroe, 9/18 in Marysville). Additional hour-long training sessions were held for at least 178 student Salmon Watchers. The primary focus of these workshops was salmon identification, however, about 10% dealt with reporting problems that might be encountered while Salmon Watching – including water pollution. (277 workshop contact hours)

Teacher Workshops

3/1/03 Learning About the Land - a total of 7 educators participated in this 5-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. (35 contact hours)

8/13,14,15/03 Project WET & Aquatic Wild – a total of 21 educators participated in this 20-hour workshop held at the PUD in Everett. The primary theme was using water resources as a theme to integrate required topics. More than 50% of the activities demonstrated to the teachers focused on water quality, nonpoint pollution sources, pollution prevention, and BMPs. (420 contact hours)

10/4 & 5/02 Salmon: Past, Present, and Future - a total of 17 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. (170 contact hours)

11/8/03 Words & Images From the Watershed- a total of 6 educators participated in this 7-hour workshop held at Camp Killoqua north of Everett. The primary theme was using poetry and art to study watersheds, water quality, drainage/flooding, and salmon. (42 contact hours)

11/15/03 The Art of Science – a total of 45 educators participated in this 90-minute workshop hosted by the Snohomish County Arts Council in Everett. The primary topics were art and salmon, however, approximately 20% of workshop tied back to water quality, nonpoint pollution sources, and pollution prevention. (67.5 contact hours)

Watershed Tours

5/8/03 North Creek Bus Tour with James Monroe Elementary – a total of 25 5th grade students and 10 parents participated in this 6 hour watershed tour. The purpose of the trip was to review water quality issues and release the coho the students had raised from eggs. The concept of dissolved oxygen was reinforced when the battery operated pump was accidentally left behind and the 500 fingerlings nearly died from lack of oxygen. (210 contact hours)

5/13/03 Kayak Point Beach Walk with Cedarcrest Middle – a total of 110 8th grade students and 15 parents participated in this 3-hour trip to the beach. While at the beach each student spent 45 minutes with a beach naturalist learning about beach processes, habitat, and water quality issues. (93.75 contact hours)

6/2/03 Meadowdale Beach Walk with Westgate Elementary - a total of 50 4th grade students and 10 parents participated in this 3-hour trip to the beach. While at the beach each student spent 45 minutes with a beach naturalist learning about beach processes, habitat, and water quality issues. (45 contact hours)

6/12 Kayak Point Beach Walk with Totem Falls Elementary - a total of 50 5th grade students and 10 parents participated in this 3-hour trip to the beach. While at the beach each student spent 45 minutes with a beach naturalist learning about beach processes, habitat, and water quality issues. (45 contact hours)

6/13 Kayak Point Beach Walk with Totem Falls Elementary - a total of 50 5th grade students and 10 parents participated in this 3-hour trip to the beach. While at the beach each student spent 45 minutes with a beach naturalist learning about beach processes, habitat, and water quality issues. (45 contact hours)

Confluence Seminars

Four of the eight Confluence seminars offered in 2003 dealt with water quality issues, participants learned about sources of nonpoint pollution, pollution prevention, and BMPs

<u>Date</u>	<u>Topic</u>
1/29/03	TMDLs
2/26/03	Built Green Program & Checklists
4/23/03	SuWM's Volunteer Lake Monitoring Program
5/27/03	West Nile Virus management Strategies

Community fairs

Staff spoke with more than 800 citizens at 6 fairs and community events throughout the County. The fairs included: the Lake Stevens Aquafest, the Stillaguamish Festival of the River, and Beach Expos at Picnic Point Beach, the Mukilteo Lighthouse Festival, Mukilteo Lighthouse Beach, and Jetty Island. (66.66 contact hours)

Overall, SuWM programs/staff generated 10,189 educational contact hours with citizens related to surface water issues.

Farm/Livestock Owner Education

Farm Management Workshops sponsored by the Snohomish Conservation District included Horses for Clean Water, Fall Pasture Rotation/Fencing Class, Alpacapoolooza, Commercial Stables Class, and Small Farm Expo.

The Snohomish Conservation District published and distributed four editions of The Nexus, their quarterly newspaper. They also designed and distributed a general information flyer on SCD services for small-scale farmers.

The Snohomish Conservation District attended and participated in numerous fairs and festivals, including the Silvana Fair, Stanwood-Camano Fair, Evergreen State Fair, and Festival of the River.

Onsite Sewage System Owner Education

SuWM staff continue to distribute information to septic owners about proper care and maintenance of their systems. In addition, SuWM staff worked in conjunction with the Stillaguamish Clean Water District Board on a Septic Subcommittee formed to make recommendations for the development of a comprehensive septic education program for residents of the Stillaguamish Watershed. SuWM staff also prepared a grant proposal to implement a comprehensive pilot program through the Centennial Clean Water Fund. Funding determination will occur in 2004.

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 initially contracted with WSDOT to present formal certification training in Construction Site Erosion and Sediment Control to over 50 employees in 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 certification training, and continuing employees attending recertification training as applicable.

These practices will continue during the term of the permit.