NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM MUNICIPAL STORMWATER PERMIT PROGRAM ANNUAL REPORT FOR CALENDAR YEAR 1999

King County
March 31, 2000

PROGRESS ON ADDRESSING EXCEPTIONS TO SWMP APPROVAL

A Washington State Department of Ecology letter of August 1, 1997, partially approved King County's stormwater management program (SWMP). Exceptions to the approval included the County's proposed revised Surface Water Design Manual (SWDM) and the County's actions to control phosphorous in Lake Sammamish.

Lake Sammamish (the Lake)

Water Quality

Water quality goals for Lake Sammamish continue to be based on the assumption that the Lake is phosphorus limited and control of phosphorus loading to the lake will control primary productivity and water clarity. All of the water quality control activities currently being carried out in this watershed address external phosphorus loading from the watershed to varying degrees. Control of external phosphorus loading also results in many secondary benefits to the watershed, such as the control of erosion and sedimentation, and preservation of fish habitat, forest, and riparian cover.

An empiric goal of 22 µg/L mean annual volume-weighted total phosphorus (VWTP) is used to meet the chlorophyll-*a* goal of 2.8 mg/m^3 . Concentrations of chlorophyll-*a* $\leq$ 2.8 mg/m^3 historically resulted in summer average Secchi dish transparency of $\geq$ 4.0 meters. Summer epilimnion VWTP, which is approximately the photic zone of the lake and more directly involved in phytoplankton dynamics during the stratified period, is being evaluated as a management tool for maintaining the summer chlorophyll-*a* and Secchi goals for the Lake. Concentrations of summer epilimnion VWTP goal would have to be significantly lower than the whole lake mean annual VWTP goal to achieve the similar levels of lake protection. Preliminary analysis shows total phosphorus concentrations of $\leq$ 10 µg/L in the epilimnion may achieve summer chlorophyll-*a* concentrations of $\leq$ 2.8 mg/m^3 and Secchi disk transparencies of $\geq$ 4.0 meters.

The water quality for Lake Sammamish in 1998 and 1999 has been very good. Phosphorus concentrations in 1998 and 1999 are as low as has been measured during the last twenty years. The annual mean VWTP for water year 1998 was 13 µg/L, and for 1999 was 12 µg/L, substantially lower than the 22 µg/L goal. The low VWTP in the last two years is much better news than the increasing trend toward the 22 µg/L goal of the last ten to fifteen years. It is unknown why the recent VWTP concentrations are lower, but may result from a combination of weather and stream inflow patterns as well as the activities in the watershed.

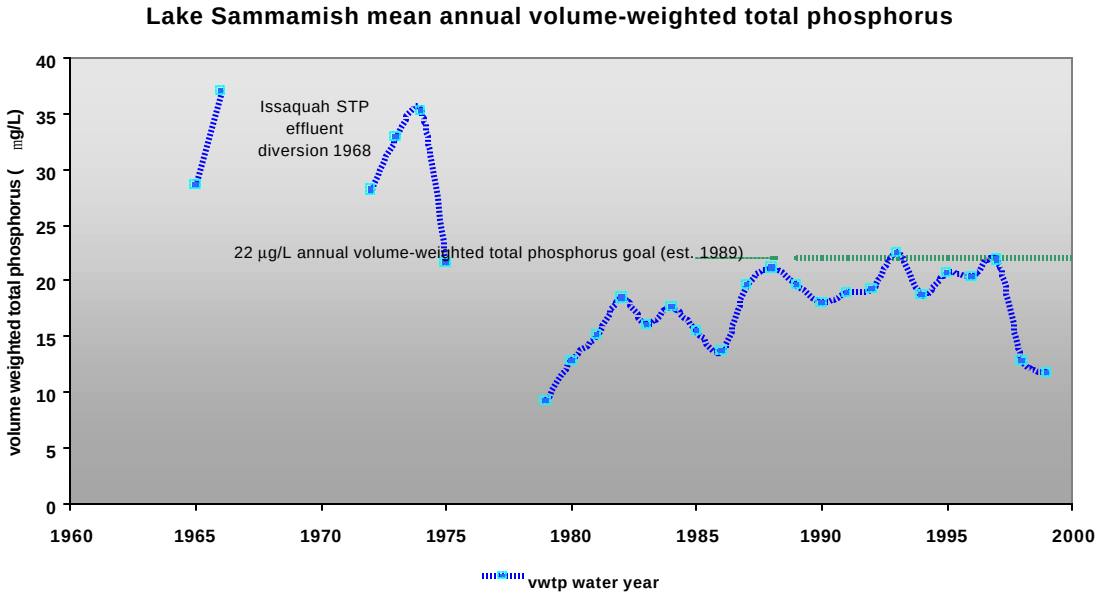
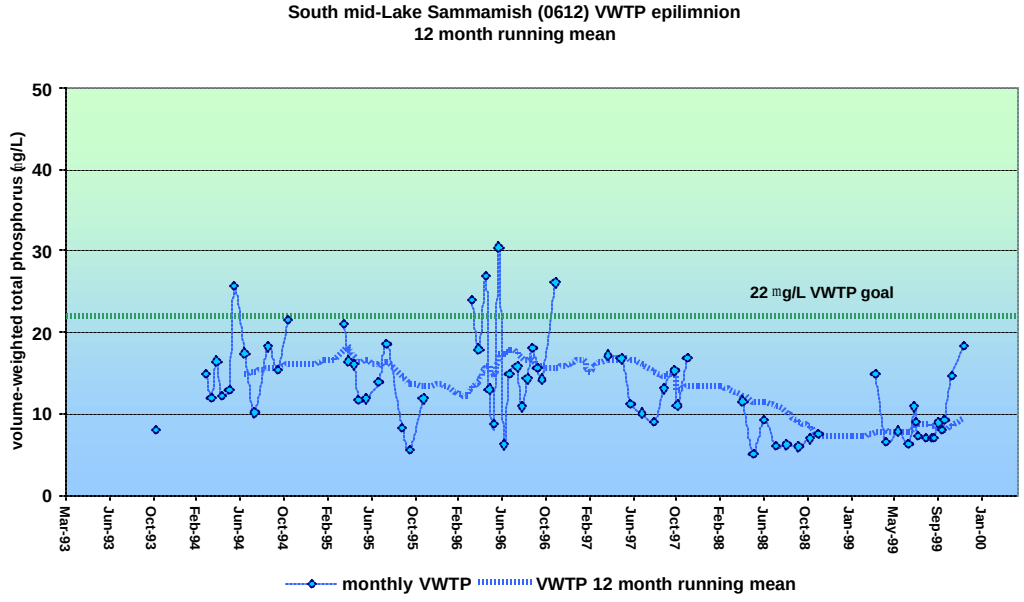


Figure 1. Mean annual volume weighted total phosphorus (VWTP) concentrations at the south mid-lake sampling station (0612).

For a decrease in the whole lake mean annual VWTP to result in decreased primary production and increased water clarity, the concentrations of phosphorus in the photic zone (that part of the lake where sunlight and nutrients interact and support phytoplankton growth) need to decrease. The more direct relationship between nutrient concentrations in the epilimnion, which approximates the photic zone, and phytoplankton productivity and lake transparency are reasons for looking at VWTP in this part of the lake.



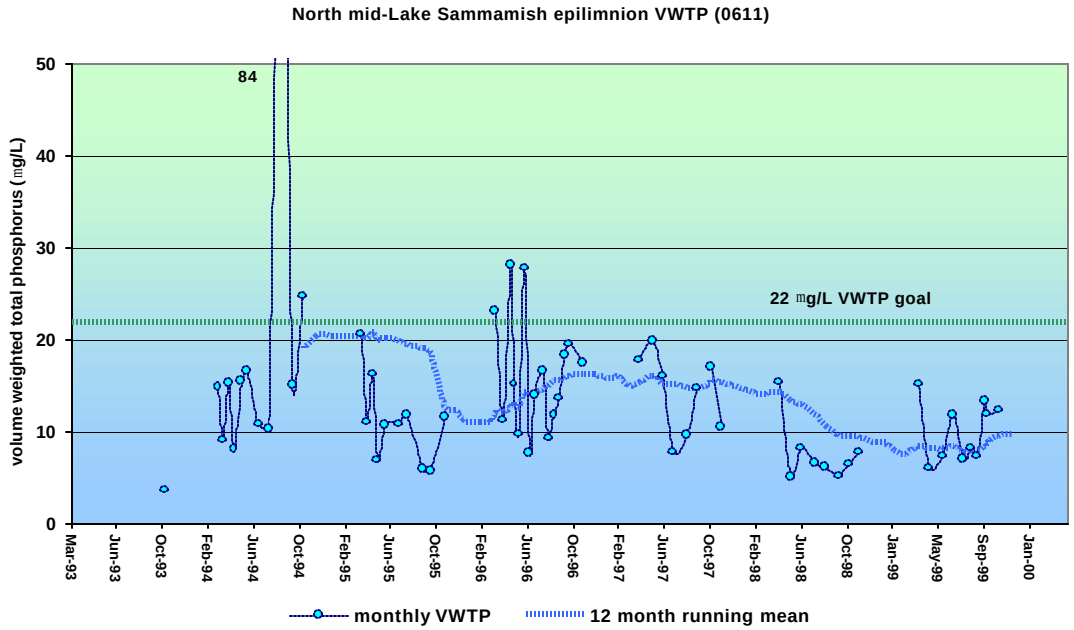


Figure 2. Monthly epilimnion VWTP concentrations for north and south lake are indicated by the dashed lines for 0611 (circles) and 0613 (diamonds). No epilimnion data is shown for the winter period when the lake is not stratified. The solid line is a 12-month VWTP running mean for the epilimnion. A running mean deseasonalizes data to show long term trends. During winter mixed conditions, data from the top 15 meters was used to generate this mean.

Epilimnion VWTP in both the north and south ends of Lake Sammamish is near 10 µg/L, and the whole lake annual VWTP is below the 22 µg/L goal. Based on the models used to monitor Lake Sammamish, chlorophyll-*a* and Secchi disk transparency should both meet or exceed the water quality goals as well. The north and south summer mean chlorophyll-*a* concentrations for 1998 (2.3 mg/m^3 and 2.5 mg/m^3) were below the goal, while in 1999 (3.9 mg/L and 3.8 mg/L), they were slightly above (Table 1). Secchi disk transparency for both 1998 and 1999 was at or better than the water quality goal of 4.0 m.

Table 1. Lake Sammamish chlorophyll-*a* and Secchi disk transparency and summer means (June-September) collected at the north mid-lake station (0611) and the south mid-lake station (0612).

collectdate	north mid-lake (0611)		south mid-lake (0612)	
	chlorophyll-*a* mg/m^3	Secchi depth meters	chlorophyll-*a* mg/m^3	Secchi depth meters
June 3, 1998	1.6	7.5	1.7	NOT RECORDED
June 17, 1998	1.8	6.5	2.1	6.0
July 6, 1998	4.5	5.5	5.2	3.8
July 20, 1998	2.9	4.5	3.1	5.5
August 5, 1998	2.0	6.0	2.8	5.0
August 19, 1998	2.0	6.5	1.7	7.0
September 8, 1998	1.6	7.0	1.3	7.0
September 23, 1998	2.0	6.6	1.7	8.0
summer average	**2.3**	**6.3**	**2.5**	**6.0**
June 8, 1999	3.5	4.0	3.2	4.0
June 22, 1999	5.2	3.0	5.3	3.5
July 7, 1999	2.6	4.5	2.8	5.2
July 20, 1999	3.1	4.0	2.8	3.5
August 3, 1999	4.1	3.5	4.3	3.5
August 17, 1999	6.2	3.3	6.3	2.7
September 8, 1999	4.0	4.5	3.5	4.5
September 21, 1999	2.6	5.0	2.5	4.5
summer average	**3.9**	**4.0**	**3.8**	**3.9**

Secchi depth transparency north and south during summer 1998 was as good as it has been in the last fifteen years (6.3 m and 6.0 m), and in 1999 at or very near the goal (4.0 m and 3.9 m). Chlorophyll-*a* concentrations north and south in 1998 were < 2.8 mg/m^3 goal, but exceed the goal in 1999. The slightly higher chlorophyll-*a* concentrations in 1999 did not result in a loss of water clarity expected from the model, or observed in the past. One reason may be a shift to more colonial forms of algae that concentrate chlorophyll-*a*, but because they are clumped do not decrease transparency to the same degree as unicellular algae. This phenomenon needs to be investigated in further detail.

The relationship between the annual whole lake VWTP, chlorophyll-*a*, and Secchi disk transparency in Lake Sammamish is still functioning. The water quality goals that have been

agreed upon for the Lake of 22 µg/L for mean annual VWTP, 2.8 mg/m^3 for chlorophyll-*a*, and 4.0 m for Secchi disk transparency are still appropriate.

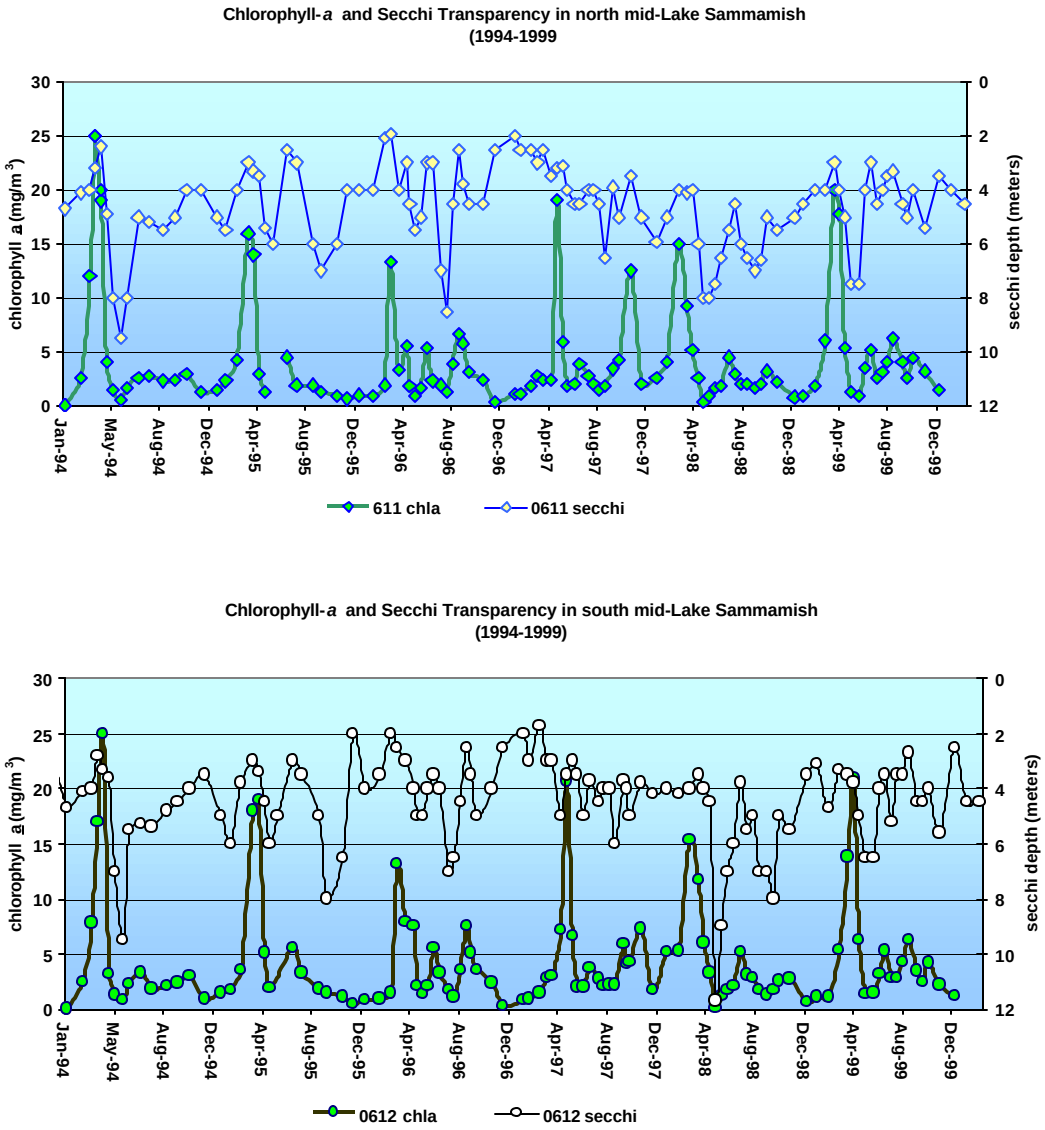


Figure 3. Chlorophyll-*a* and Secchi disk transparency at stations north 0611 (circles) and south 0612 (diamonds).

While summer water quality in Lake Sammamish has seen improvement, there are serious water quality issues in the fall. During the late summer and early fall of 1997, an extensive, toxic

bloom of *Microcystis aeruginosa* covered much of the Lake. This bloom occurred even though the Lake met the water quality goals during this period. During the late summer of 1998, a bloom of *Microcystis aeruginosa* did not occur, however a sample was collected and analyzed for toxicity. Mouse bioassay tests indicated the cyanobacteria was not toxic. Subsequent strain analysis done at the University of Washington indicated that while the cyanobacteria species was the same (i.e., *Microcystis aeruginosa)*, the specific strain was different and non-toxic. In an effort to examine potential environmental factors that influence the production of toxins, a graduate student is currently investigating this issue in Lake Sammamish with the support of King County, Seattle University, and the University of Washington.

In 1999, low concentrations of *Microcystis aeruginosa* were collected from the lake and tested positive for toxicity when analyzed using the ELISA test. While there was no bloom of toxic cyanobacteria in the lake during the fall of 1998 or 1999, the same strain of toxic algae, producing toxins at low levels, was present in the lake. It is apparent that the toxic strain of *Microcystis aeruginosa* is endemic in Lake Sammamish. If water quality conditions in Lake Sammamish deteriorate in the future and result in a cyanobacterial bloom, it would be expected that toxic *Microcystis aeruginosa* would be present.

In 1998 it was hypothesized that *el Niño* was influential in the excellent summer water quality. Summer primary productivity is dependent on addition of phosphorus to the stable upper photic zone of the lake (i.e., epilimnion) by a combination of external loading during storm events and internal loading from the hypolimnion. The large toxic bloom observed in 1997 occurred after a significant late summer rainfall event that discharged into a very stable epilimnion. In comparison, during the summer of 1998, there was little rain and subsequently little external loading from the watershed or mechanism for mixing hypolimnetic water into the epilimnion and photic zone. These conditions likely resulted in the low VWTP measured in the lake and the corresponding low primary productivity and lack of a fall algal bloom.

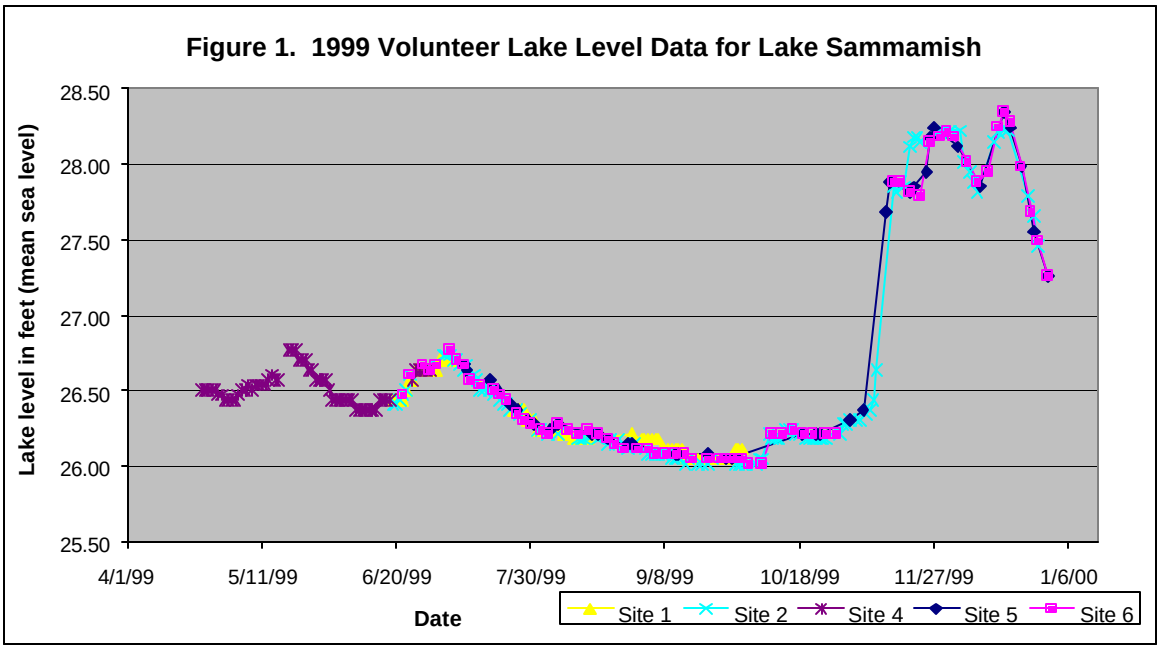
The weather pattern during the summer of 1999 was very different from 1998. Stratification was not as deep or as strong in 1999 as it was in 1998, air and water temperatures were lower and rainfall was more frequent. But summer water quality in 1999 continued to improve. It is still likely that summer weather and stream inflow patterns have a significant influence on summer water quality, but other factors obviously influence the response of the lake. The lack of extreme winter storm events and the resultant erosion and sediment transport into the lake is a provable cause. Improved watershed management in the basin by citizens groups and local governments may be another factor in this improvement. While neither citizens groups nor County policies are responsible for the weather, the water quality improvements seen in the summers of 1998 and 1999 show that limiting external phosphorus loading to the lake can result in improved water quality. All of the management policies in the Lake Sammamish watershed are designed to reduce external loading by controlling discharge of non-point source pollution to the Lake and associated streams. If these policies are continued and are successful, we should be able to meet the long-term water quality goals for Lake Sammamish.

Volunteer Program Summary

To coordinate the activities of government and citizens in improving water quality and aquatic habitat in Lake Sammamish, King County and *Save Lake Sammamish* have joined in a partnership to train and use citizen volunteers in data collection. Most of these citizens live on the lakeshore and are collecting data on a much more frequent schedule than would be possible without their efforts. Increased training results in data that can be used directly in evaluation and management of the resources. It is hoped that this project will continue and be expanded.

In April of 1999, eleven citizen volunteers were trained by King County staff to collect physical data along the shoreline. This data augments data currently collected at seven sites on the Lake by the King County Environmental Lab. Parameters monitored by volunteers included daily lake level, daily rainfall, weekly Secchi disk measurements, weekly water color, and weekly temperature. The volunteers chose to monitor the weekly parameters from their dock or from their boat anchored approximately 100 meters offshore. Volunteers also collected lake use information including the presence of boats, swimmers, birds, wildlife, and algal blooms. They also collected suspicious water quality samples if noticed, and alerted King County staff when present. Monitoring data was submitted on a quarterly basis.

Example of volunteer collected data



Progress Toward Requirements for Ecology Approval

To gain approval of the Lake Sammamish portion of the SWMP, King County was charged with making commitments to both the goals of the 1996 Lake Sammamish Water Quality Management Plan (LSWQMP) and a long-term strategy to achieve them. The 1999 report for calendar year 1998 explained the impasse that was reached in the County's efforts to achieve an updated interlocal agreement to implement the LSWQMP and explained how annexations and

incorporations, including the new City of Sammamish, have substantially reduced the County's ability to directly influence the quality of the Lake's water. As a result of these changed circumstances, the County requested that Ecology no longer withhold its approval of the Lake Sammamish portion of its Stormwater Management Program. To date, the County has not received a response to that request.

Implementation of Lake Sammamish Management Program
During 1999, King County implemented the Lake Sammamish Management Program as follows:

1. Forest Conservation Program – This program was integrated into the King County forestry program and will continue to be implemented by the County's Department of Natural Resources, Resource Lands Section, and the Department of Development and Environmental Services. The regulatory (65 percent forest retention on all rural zoned lands) and incentive (both the current use taxation and education) elements of the program are being implemented by a King County forester. In 1999, two workshops were held for forest owners to enroll in timber taxation programs. Approximately 50 acres were enrolled. [The appendix contains a flyer that provides more detail about these tax reduction programs.]

2. Non-point Source Control Program – The emphasis for this program was the completion of several educational tools, including a water steward's manual, The Sammamish Swing [copy included in the Appendix of the 1999 report], a lakeside living video, and the shoreline stewardship demonstration project. All copies in the first printing of the Sammamish Swing were distributed and it will be reprinted in 2000. The distribution of these educational materials throughout the watershed is being led by two non-profit community groups, Save Lake Sammamish and the Pomegranate Center. Traditional planting events, workshops, and the Issaquah Salmon Days emphasis on the whys and wherefores of phosphorus as a pollutant also continued. Newspaper coverage of the Lake and its condition occurred intermittently throughout the year.

3. Regulatory Compliance and Enforcement – the King County Erosion Control program continued with a dedicated inspector in the unincorporated portion of the basin. The cities of Issaquah and Sammamish also have erosion control inspectors.

4. Enhanced Operations and Maintenance – no changes were made in maintenance practices for detention and water quality facilities in the basin in 1999. The University of Washington is continuing research to evaluate increased pollutant removal for roadside ditches using alternative maintenance practices. Such practices will be changed if new information becomes available.

5. Lake Protection Standards – 50 percent phosphorus removal standards for new development were adopted for the unincorporated parts of the basin in January 1998. These standards have been implemented since that time and were superceded by adoption of the 1998 King County Design Manual in 1998. In 1999, the County applied for and received a $250,000 grant from the United States Environmental Protection Agency to evaluate the feasibility of

implementing regional stormwater treatment in the Lake Sammamish Basin. The study will be initiated in 2000.

6. Public Ownership and Shoreline Access – King County has purchased and is developing the East Lake Sammamish Trail. Citizens, the King County Land Trust, and King County Parks are also evaluating possible shoreline parcel acquisitions in conjunction with the trail development. King County and the City of Issaquah are cooperating to develop a Waterways riparian corridor from Lake Sammamish State Park to the Taylor Mountain site purchased by the County in 1997 in upper Issaquah Creek (headwaters of Holder and Carey Creeks). In 1999, the program completed its first acquisition.

The three short-term programmatic actions identified for King County action—an erosion control program, a source control program, and implementation of the 50 percent phosphorus standards for new development—have all been incorporated into the County's ongoing management of the Lake. Four of the eight capital projects identified as short term actions—Valley Growers Nursery, Sunset Quarry, Weowna Creek, and Idylwood Creek—were constructed or completed during 1997 or 1998. The Issaquah State Hatchery project is moving forward. Kelly Ranch is being evaluated by the City of Issaquah for mitigation in conjunction with the development of East Village. The Bianca Mine project is being completed as part of the ecosystem restoration studies initiated by the Army Corps of Engineers. [More detail available in the Lake Sammamish Initiative Table provided in the appendix.]

In addition, King County committed staff and budget resources to working during 1999 to develop a regional watershed fee and program to provide stable funding and staff support to protect and restore regional surface waters including Lake Sammamish. This commitment is critical given the lack of adequate public dollars for full implementation of such programs.

The Lake Sammamish Forum Coordinator position, vacant as of October 1998 was filled in 1999 by Lorin Reinelt from the City of Issaquah. The Lake Sammamish Project Manager position, also vacant as of October 1998, was filled in 1999 by Deb Lester.

Surface Water Design Manual (SWDM)

The update of the County's Surface Water Design Manual (SWDM), adopted in September of 1998, continued to be implemented through 1999. User support, in the form of classes and a user help line, were effective in familiarizing design engineers with the Manual requirements and design and method changes. Implementation seems to be going smoothly.

Changes to the SWDM to better achieve equivalency with the Ecology Manual were proposed in a letter of December 30, 1999 to Megan White. These changes have not yet been promulgated in public rule and are currently awaiting feedback/acceptance from Ecology or adoption of the proposed Site Alterations Ordinance for amending the County's Grading Code. The proposed Site Alterations Ordinance was distributed for review in 1999 and is currently being revised in

response to comments. The revised ordinance was to be transmitted to the King County Council for action during the second quarter of 2000. However, transmittal to the Council will be delayed as a result of recent direction from the Executive that all ordinances implementing the County's response to the ESA listing of chinook salmon and bull trout be packaged and transmitted together. Although the Site Alterations Ordinance will be ready for Council action in the second quarter of 2000, because it is considered to be part of the County's ESA response, it must await the publication of the chinook 4(d) rule, and the drafting of other responsive ordinances, before it is transmitted--a probable delay of approximately one year.

In addition to Manual implementation, programmatic actions have been approved in the 2000 budget to better achieve equivalency. These include additional staff for source control inspections of sites with recently issued permits and additional staff for sub-basin studies of urban areas to identify project needs for addressing post-1975 impacts to beneficial uses. Work to scope and implement these new programs has already begun.

The following discussion focuses on the elements of the annual report required by the above referenced permits.

S10 (B) 1: STATUS OF IMPLEMENTING THE COMPONENTS OF THE SWMP

All the requisite components of a SWMP are in place in King County, with the exceptions noted above. Although there are some minor changes in the timing or magnitude of some of our compliance activities, our program today continues to be substantially the same as that described in our approved SWMP.

S10 (B) 2: NOTIFICATION OF RECENT OR PROPOSED ANNEXATIONS OR INCORPORATIONS RESULTING IN A… DECREASE IN PERMIT COVERAGE AREA

From January 1, 1999 to December 31, 1999, King County lost 14,037 acres to annexations and incorporations. That number includes the 13,556 acre incorporation of the City of Sammamish. With the incorporation of the City of Sammamish, King County lost jurisdiction over a substantial portion of the area draining to Lake Sammamish, as well as Pine Lake, Beaver Lake, and Laughing Jacobs Creek. Information about the specific recent and proposed annexations and incorporations is shown on a map included in the Appendix.

In 1999, King County lost over $1,060,000 in surface water management fee revenues to annexations and incorporations. King County expects to lose an additional estimated $310,000 in 2000.

S10 (B) 3 & 4: DIFFERENCES BETWEEN PLANNED AND ACTUAL EXPENDITURES FOR THE REPORTING PERIOD & REVISIONS TO THE REMAINING YEARS OF THE FISCAL ANALYSIS

King County's detailed fiscal analysis is included in the Appendix. In summary, the County's planned spending for NPDES stormwater related activities in 1997 was $41,187,613. Actual spending for 1997 was $43,687,182—an increase of 6.07%. The planned spending for 1998 was $40,999,081. The total adopted by Council was $41,726,006—an increase of 1.77%. A report on the difference between adopted and actual spending for 1998 will be included in the 1999 report.

S10 (B) 6: A SUMMARY DESCRIBING COMPLIANCE ACTIVITIES, INCLUDING THE NATURE AND NUMBER OF OFFICIAL ENFORCEMENT ACTIONS, INSPECTIONS, AND TYPES OF PUBLIC EDUCATION ACTIVITIES

DSS Inspections and Enforcement Activities

Drainage facility inventory numbers have remained fairly constant--new facilities are keeping up with annexations and incorporations. The Drainage Services Section (DSS) of the Water and Land Resources Division continues to inventory commercial conveyance-only facilities, but does not inspect them. DSS is considering new programs that may include monitoring these facilities.

DSS continues to be the initial investigators of drainage complaints. As shown, many facility complaints result in corrective work orders. Additionally DSS corrects drainage problems by designing small improvement projects in our Neighborhood Drainage Assistance program.[1] These programs may increase as a result of the extension of the SWM service area to the rural portion of the County[2]. The 2-year maintenance/defect program continues to include quarterly

[1] The Neighborhood Drainage Assistance Program (NDAP) is a DSS program that addresses drainage problems not covered by other R/D or road maintenance programs. It builds small projects to remedy off right-of-way drainage problems, of which many are located on private property. NDAP projects quite often result from a DSS drainage complaint investigation that escalates to a drainage review. The projects are prioritized and then funded for construction on an annual basis. Contracted maintenance crews perform the work under the guidance of DSS engineers. NDAP has been a successful program for addressing problems neither referred to other agencies nor addressed by general maintenance programs within DSS.

[2] The SWM service area and fee extension was passed by the Council at the very end of 1999 and is controversial. Ordinances to repeal and delay it have both been introduced in Council and final votes are expected in April of 2000.

inspections of new drainage systems. The phased inspection program is being evaluated for continuation based on its effectiveness. Maintenance programs remained unchanged in 1998 and 1999.

The largest DSS program change has been the revitalization of annual commercial R/D facility inspections. Evaluation of the owner-performed self-certification program indicated that DSS inspections were preferred by commercial property owners, and produced better compliance with maintenance standards.

Additional program changes are in progress to enhance the Stormwater Management Program. The complaint tracker program is being upgraded with GIS/GPS capabilities to facilitate monitoring drainage complaints and using facility maps. The R/D inspection Management Information System[3] is also being redeveloped to improve maintenance tracking and scheduling. Both will facilitate the use of historical data to address drainage problems.

Enforcement Actions & Inspections--R/D facilities
The spreadsheet below identifies the total number of retention/detention (R/D) inventories and assessment activities for 1996 through 1999.

	INVENTORY TOTALS (as of 1/5/99)	WORK PROGRAM	INSPECTION TOTALS			
			1996	1997	1998	1999
RESIDENTIAL						
2-Year Bond	78	2-Year M/D Bond Inspections	93	160	225	211
	1,170	Inspections (Unincorporated)	902	683	833	592
		Special Use Permits	35	33	53	40
Total	1,248	New Facilities Inventoried	43	66	87	56
COMMERCIAL						
Unincorporated D9	748	County inspected in 1999				
NPDES Facilities	414	NPDES Inspections	48	118	38	13

[3] The DSS Management Information System (MIS) enhances the Drainage Investigation and Inspection (DI&I) Unit's R/D inspection and maintenance program. This computerized program is used to maintain a facility inventory, perform facility inspections, produce work authorizations or maintenance correction letters, and to track completion of work. The historical database contained in this program is used to do a "phased" analysis for inspection scheduling. This software is currently being redeveloped to better suit the redefined responsibilities of DI&I, and to fit many of the newer R/D facility features developed in the Design Manual.

Total	1,162	New Facilities Inventoried	20	32	38	793

Enforcement Actions & Inspections--KCC 9.12 Activities *(Including corrections to the information provided in the 1999 report for calendar year 1998.)*

INVESTIGATION TYPE	CARRY OVER	NEW (in '98)	CLOSED (in '98)	OPEN
COMPLAINTS★ (quick response)	18	~~72~~ 100	~~73~~ 101	~~15~~ 17
REVIEWS☆ (more complex response)	95	31	26	121
SITE CONSULTATIONS☆ (for businesses)	219	26	28	213
ENFORCEMENTS✯ (violations issued)	29	0	4	25

INVESTIGATION TYPE	CARRY OVER	NEW (in '99)	CLOSED (in '99)	OPEN
COMPLAINTS★ (quick response)	17	86	74	26
REVIEWS☆ (more complex response)	121	78	49	129
SITE CONSULTATIONS☆ (for businesses)	213	10	17	206
ENFORCEMENTS✯ (violations issued)	25	4	7	22

★**Complaints (quick response):** All water quality complaints that are received by WLR are reviewed by a Senior Engineer to see if an initial quick visit by a technician may be sufficient to solve the problem. If so, a technician visits the site and collects all pertinent information. If the problem is a simple problem or one that can be resolved with a little bit of information or education by the technician the complaint can then be closed. If the Senior Engineer determines the complaint is more involved at the time of the initial review, an Engineer investigates the problem as a **Review**.

If a technician visits the site and finds more involved issues at the site, or if the individual or business where the complaint originates needs more detailed, technical information the complaint is "turned into" a **Review**.

☆**Reviews:** (Handled by an Engineer) These problems often require writing letters to the property or business owner where the water quality problem is occurring and explaining in more detail KCC code 9.12, or outlining additional ways to correct the water quality problem.

A review often requires additional research to find the source, potential impacts, and severity of the water quality problem. A review also may require coordination with other agencies such as DOE, KC Health, Hazardous Waste, Solid Waste, Roads, or others.

☆**Site consultations:** An engineer visits a business site with the owner/property manager. All BMPs that are required for the site to achieve compliance with KCC 9.12 are discussed and an implementation schedule is agreed upon. Once the owner/property manager feels that all BMPs are in place, the engineer revisits the site, and if the site is in compliance, the file is closed and the business is referred to the Businesses for Clean Water program for recognition.

✶**Enforcements:** These cover a variety of problems. The first step in the process is a Notice of Violation that explains the specific violation and the steps necessary to correct the Violation. Once the violation is corrected, a Release of Violation letter is sent. The types of violations we see vary and involve both business and residential properties.

Enforcement Actions and Inspections--Erosion and Sedimentation Control

The Erosion Control Inspection & Enforcement Program is based in the King County Department of Development and Environmental Services. The program was increased from one (1) engineer in 1998 to a total of four (4) engineers in 1999 who deal with permitted sites. An additional four (4) Site Development Specialists were assigned to cover non-permitted activity. The scope of the program also increased from enhanced inspections of permitted activities for Erosion/Sediment Control compliance (ESC) in the Lake Sammamish Basin only, to the whole County.

Regular ESC inspections involve identifying potential drainage-related erosion problems on permitted sites. However, the regular inspectors typically visit sites for other project inspections and processes--the ESC inspection is incidental to the overall inspection process. Based upon their current workload and process priorities, the regular inspectors visit project sites less frequently than might be optimal for ensuring full compliance. However, the inspectors performing enhanced ESC inspections visit sites only for the purposes of observing whether appropriate ESC Best Management Practices (BMP's) are used. They have the time and are authorized not only to note violations, but also to provide on-site training in the proper use and installation of ESC BMP's—a function that is not performed by regular inspectors. Enhanced ESC inspection areas include the Green River, Cedar River, Sammamish River, Bear Creek, and the Snoqualmie River Basins. [See the Appendix for a map showing enhanced ESC inspections performed during 1999.] The program still provides services in the Lake Sammamish Drainage basin, but with the incorporation of the City of Sammamish and annexations by Issaquah, these services will be limited to activities permitted by DDES prior to incorporations and annexations. In addition to ESC enforcement, the program implements the portion of the County's response to the Endangered Species Act (ESA) relating to the inspection of non-permitted sites.

The enhanced ESC inspection program serves three main functions. First, it enhances ESC inspections on permitted activities, as described above. These include permitted activities from clearing and grading, short plats, subdivisions, commercial, and residential. The appendix

includes a map that shows the number of permitted sites with enhanced erosion inspections during 1999. By mid-August 1999, 4 full-time inspectors were hired and trained for activities County-wide. For the year, a total of about 2,800 separate inspections were conducted at construction sites that were not possible in previous years with only one inspector and limited coverage area. Some inspections resulted in violation notices and enforcement actions. Frequently, as a result of the increased number of inspectors, enforcement occurred *before* rain events, which meant that the program was more successful in monitoring and preventing potential erosion problems.

The second of the program's three main functions involves the provision of technical assistance through guidance on the use of BMP's at specific construction sites and more general training for the development community, county staff, and the public. Many of the site visits conducted in 1999 focused builders' attention on better erosion control practices. In addition, staff developed information for a DDES web page to offer additional information to builders (http://www.metrokc.gov/ddes –from the hot topics, choose *Erosion Control and the ESA*). During the last year DDES met with 5 major developers about the ESC program. They expressed a keen interest in a training program for 2000 that would bring their contractors and DDES inspectors together to focus on ESC BMP's.

The third main function of the enhanced ESC inspection program is the pursuit of enforcement actions on sites that are not permitted and are in violation of King County Drainage Manual (Appendix C & D of 1998 Manual) and other regulations as they apply to water quality and ESA issues for both permitted and non-permitted activities.

Inspections & Consultations—Hazardous Waste

WLRD Hazardous Waste Management Program site investigators conducted 2521 site visits to businesses in 1999. All visits include at least a limited site assessment for water quality issues. In addition, 941 telephone consultations regarding environmental issues were made with business and agency staff in 1999.

Public Involvement and Training Activities

Department of Natural Resources

Public Involvement Program

During 1999, chinook salmon continued to evolve as a barometer of watershed health in King County. This Northwest icon is serving as a water quality rallying point and is being used to raise awareness and call citizens to action. A variety of communications tools are being used to help more citizens become aware of water quality issues affecting people and fish. Now that chinook salmon has been listed as threatened under the Endangered Species Act, the media is showing a renewed interest in environmental protection. We have been able to leverage this interest by using the media to get our water quality messages out to a larger and more diverse audience.

As a result, more citizens have learned about our volunteers' program and are getting involved in efforts at home and at work to protect our region's water resources. The power of volunteers becoming practitioners of environmentally friendly behavior and ambassadors for our water quality message cannot be overestimated. These people give credible testimony about the need for personal action to their friends, relatives and neighbors.

- **Natural Connections Television Program**
  Partnering with KOMO-TV, King County produced a professional television documentary that included an in-depth segment on the challenges faced by King County in response to the listing of chinook salmon as a threatened species. The partnership and television program were designed as a new tool to reach audiences who normally don't turn out for tree plantings and public meetings. Called ***Natural Connections***, the televised program featured a King County senior ecologist who spoke of salmon in a broad sense as indicators of water quality and went on to describe the salmon's contribution to the natural web of life, the causes of the salmon crisis and citizens' impact on water quality. The show reached an audience of 400,000 and helped generate awareness that all species are connected by water. The video is now distributed in local public school science classes.

- **Watershed Public Outreach**
  Following in the footsteps of the Natural Connections program, King County is looking at the earth's natural connections and how they are affected by our individual actions and is delivering its water quality messages accordingly. The classroom has gone outdoors. Watershed tours were given at sites along the Cedar River and Puget Sound beaches involving nearly 6,000 citizens. Stakeholders who have significant responsibility in developing salmon recovery plans flew by helicopter over King County watersheds to get a bird's eye view of the challenges currently affecting people and fish. Residents in the Snoqualmie valley celebrated their watershed by holding a festival and setting up displays featuring successful stream and habitat restoration efforts.

  In addition, 600 watershed identification signs and 500 "This stream is in your care" signs were created and installed throughout the County. The signs now feature new information identifying the watershed in which the stream is located to further educate people that they are connected to a watershed.

  Water quality issues will continue to play a significant role in the Watershed Planning decision-making process citizens that county staff will be engaged in over the next five years. Our hands-on public outreach event planning activities may be delegated to grassroots community groups over time to enable county staff to play a supportive role in the watershed planning processes.

- **Volunteers Program**
  A total of 4,109 citizens spent 19,367 hours participating in hands-on projects
  - More than 300 people participated in native plant salvage events, digging up a total of 4,800 native plants for future restoration protects. As an added bonus, the ***Native Plant***

Salvage Program was covered by KCTS as part of its salmon series and the King County cable channel produced an eight-minute video describing how native plants are used to prevent stream bank erosion.

- 27,852 plants were planted along local streams and rivers to stabilize banks, prevent erosion and protect salmon rearing beds. Citizens also participated in the ***Habitat Partners Program***, providing restoration site maintenance to these newly planted areas.
- 8,000 hours were spent by volunteers on restoration projects that improved and protected water quality.
- Through the ***Storm Drain Stenciling Program***, 525 Storm drains were stenciled with the message, "Dump No Waste, Drains to Stream" by 99 volunteers in an effort to change car maintenance behavior. Car wash kits were also loaned out to keep harmful soapsuds out of storm drains and waterways.
- The need for volunteers to do water quality monitoring continues to grow. Scientific data will be used to determine what projects need to be given priority during the watershed planning process. Volunteers monitored small lakes and Lake Sammamish this past year. Aquatic weeds were monitored in lakes, amphibians were monitored in wetlands and salmon were counted. These efforts provided data that is useful in measuring and predicting watershed health over time.

- **Grants Program**

The ***Watershed Action Grants Program*** funded a project titled, ***Horse Businesses for Clean Water*** through a partnership with Rainier Audubon Society. A manual was created that provides information on environmental laws and regulations affecting commercial operations of horse businesses. Impacts to water quality were addressed in the manual. King County's Livestock Ordinance is explained and actions horse owners need to take to stay in compliance are described. Curriculum materials have been developed for two workshops that will be held in 2000. In a project titled***, King County Auto Recyclers Voluntary Stormwater Compliance Assistance Program***, the Auto Recyclers of Washington updated their Stormwater Pollution Plan, conducted site visits and held workshops to offer assistance to businesses who want help developing their own stormwater protection plans and site inspections. (For more information about the grants program, visit the website at http://dnr.metrokc.gov/wlr/pi/grants.htm.)

- **Public Information and Education Programs**

A total of 13,991 citizens were educated

- ***Naturescaping Workshops*** attracted 120 citizens who learned how and why to use native plants in their home landscapes, keeping pesticides and fertilizers out of lakes, streams, rivers and marine waters.
- ***Education booths and displays*** at the Northwest Flower and Garden Show, King County Fair and Issaquah Salmon Days explained the value of planting native plants and removing non-native invasives, mulching with grass clippings, reducing the use of garden clippings and much more.
- Over 5,000 students received presentations on water quality, wastewater treatment, watershed and taking personal responsibility to protect aquatic ecosystems through the ***King***

County Water Quality Education Program. Attached to this report is a sample of the packet given out to schools that conveys the importance of scooping pet waste, using environmentally-friendly household cleaners and understanding that water is a finite resource.

- More than 80 audiences and 2,200 people received information about salmon, the Endangered Species Act and ways people can help protect salmon from presenters belonging to the ***Salmon/ESA Speakers' Bureau***. A Web-based slide show was produced to spread the word to a diverse audience.
- The ***Tri-County Salmon Information Center*** is in full swing and continues to provide a toll-free phone number and answer salmon-related questions and offer citizens with opportunities to get involved in salmon conservation efforts. Information on volunteer events through the Center is available at http://www.salmoninfo.org/scripts/eventsearch.asp.
- ***Magnets*** were given out at environmental fairs and flower and garden shows with the message, *"Clean Water is Good for You and Me"* and things people can do at home to protect water quality.
- Two issues of ***The Downstream News*** newsletter were published last year and were circulated to 9,000 citizens. Both issues contained ESA updates and information on education resources and volunteer opportunities.
- A brochure titled, ***Home and Garden Hints for Healthy Streams and Salmon*** explains what residents can do to protect water quality and help salmon and were included in Home Resource Kits sent to 9,000 new county homeowners. This information is available through the following webpage: http://www.metrokc.gov/exec/esa/. Click on "Home and Garden Hints."
- The ***Green Businesses Directory*** was updated and distributed to county residents. It helps businesses and residents support companies that care about the environment. This allows us to reward the behaviors we want to see that will improve our water resources. This was followed by ***Green Globe Awards*** ceremony that recognized leaders in habitat and water quality protection, industrial and hazardous waste reduction and recycling efforts. (A list of Green Globe Award winners is available at http://dnr.metrokc.gov/grnglobe/grnglobe.htm.)

- **Lake Stewardship Program**

In 1999, the Lake Stewardship Program

- trained and supported citizen lake monitors on 44 small lakes to sample and record water quality and quantity information;
- conducted quarterly workshops/tours focusing on monitoring techniques, aquatic weed identification, waterfowl identification, and best management practices;
- published and distributed quarterly *Lake Steward* newsletter to lakeside residents, providing information on water quality protection and enhancement activities;
- provided technical assistance to lakeside residents, addressing water pollution and protection activities; and
- enhanced its website to increase public access to the program's resources. View it at http://dnr.metrokc.gov/wlr/waterres/smlakes/index.htm.

- **Hazardous Waste Management Program**
  The Hazardous Waste Management Program has several efforts that aim to protect water quality by reducing residents' use of pesticides. The Natural Lawn Care Project, a cooperative effort with the City of Seattle and other local governments, uses advertising, media events, brochures and other methods to encourage people to change their lawn care methods. Natural lawn care methods will mean reduced use of pesticides, fertilizers and water.

  Pesticides in King County streams were the focus of two natural lawn care media events in 1999. Research, undertaken as a cooperative effort of King County and state and federal agencies, found a direct connection between pesticides found in King County streams and those sold in home and garden stores. The media events also discussed ways to reduce pesticide use.

  "Grow Smart, Grow Safe," a consumer guide to lawn and garden products, was produced in 1998. The booklet rates 300 pesticides and fertilizers for their effects on health and the environment, and provides information on integrated pest management approaches to problems such as bugs and weeds. It is widely distributed through nurseries, the Northwest Flower and Garden Show, workshops and other methods. A consumer web site that includes detailed information on alternative pest control methods was developed and is available at http://www.metrokc.gov/hazwaste/house/.

  The Hazardous Waste Program has been working with the Washington Association of Landscape Professionals on an advanced endorsement in environmental landscaping as part of WALP's Certified Landscape Technician program. A study manual and field test have been developed; the Washington test is the pilot for a possible nationwide certification.

King County Park System

The King County Park System manages many properties purchased to protect salmon habitat. In 1998 and 1999, the Interpretive Programs Office significantly increased its programming at these sites and on the topics of salmon habitat and water quality. Following are some descriptions of our salmon programs.

- **Stream Connection (School Program)**
  In October 1998, the *Stream Connection* program was launched and received rave reviews from teachers and parents. Focusing on salmon and water quality, the program has involved 1,872 students and parents in classroom presentations and field experiences. Primary field sites are Cavanaugh Pond (Renton), Bear Creek (near Woodinville) and Tolt River (Carnation). Comments about the classroom: "The combination of slides, puppets and hands-on activity was perfect." "The program was superb!" "The students LOVED this presentation!!" Comments about the field experience: "This is the best field trip we've ever had!" "We love the 'heads on' and 'hands on'!" "This is better for the students than raising salmon in the classroom."

- **Interpretive Programs (Public Programs)**
  In 1999, the Interpretive Programs Office has offered significantly more programs to the public on the topic of salmon and water quality. Most, but not all, of the programs are geared for children and involve hands-on learning. Following is a list of some of the programs offered:
  Searching for Salmon – 12/30/98 – Cavanaugh Pond – 60 participants
  Stream & Pond Detectives - 4/15/99 – Rock Creek Park Natural Area – 28 participants
  Stream & Pond Detectives – 5/4/99 – Cavanaugh Pond – 21 participants
  Assessing Salmon Habitat – 9/15/99 – Rock Creek Park Natural Area – 15 participants
  Assessing Salmon Habitat – 9/18/99 – Griffin Creek Natural Area – 7 participants
  You're the Water Scientist – 10/3/99 – Cavanaugh Pond – 27 participants
  Amazing Adventures of Wild Salmon – 10/5/99 – Woodinville Library – 37 participants
  Amazing Adventures of Wild Salmon – 10/18/99 – Kent Regional Library – 30 participants
  Searching for Salmon – 10/31/99 – Bear Creek Natural Area – 24 participants

- **Cedar River Salmon Journey**
  In the fall 1998 and 1999, nearly 3,500 visitors participated in *the Cedar River Salmon Journey*, an innovative partnership involving King County Parks, King County DNR Water and Land Resources Division, Seattle Public Utilities, the Seattle Aquarium and the Army Corps of Engineers. Through the 1999 program, staff trained 32 volunteers to be naturalists. The volunteer naturalists presented information on salmon and natural and human history of the Cedar River at four sites.

- **Employee Training Related to Water Quality**
  Soils for Salmon - 6 employees (1 day)
  Watershed Management - 1 employee (5 days)
  Amphibian Monitoring - 1 employee (2 days)
  UW Center for Streamside Studies seminars - 4 employees (1 day)
  Pesticide Recertification Training - 3 employees (avg. 8 hours/1 day/year)

  A high level of informal field training is also provided.

  The Maintenance and Facilities Division wrote a draft Best Management Practices Manual in 1999 that is being reviewed and field tested in 2000. Most, if not all, of the BMP's relate to water quality.

  The Division also added a fifth Resource Coordinator to their staff for the Green-Duwamish. RCs are similar to Basin Stewards. They focus on restoration projects and resource issues on our open space/natural resource lands, many of which are directly related to water quality. This additional position will improve both the quality and quantity of service, as the Cedar and Green together were previously covered by only one position.

Integrated Pest Management

In 1999, King County adopted an executive order that requires its own operations to follow an integrated pest management ("IPM") approach and, in addition, to phase out the use of certain pesticide products. As part of the County's ongoing work to reduce pesticide use in the region (see the Natural Lawns Campaign and other activities described under the Hazardous Waste Management Program in the section on public education) and tied with its ESA/salmon recovery efforts, King County worked with the cities of Seattle, Bellevue and other jurisdictions to develop a model IPM policy for public entities. This policy was developed as a general recommendation by a Tri-County technical group. In October, 1999, the City of Seattle announced its pesticide-reduction program which is fully consistent with the Tri-County policy. At the same time, King County announced its intent to follow suit and an Executive Order on IPM was signed on November 5, 1999. [Copies of this and related documents can be obtained via the County's website at: http://www.metrokc.gov/hazwaste/ipm/.]

Both the Seattle and King County programs direct departments and divisions within the jurisdictions to follow IPM approaches to landscaping, road maintenance and other outdoor activities that control weeds, insects, or other "pests." In addition, both jurisdictions direct that the use of certain pesticidal products deemed too hazardous be phased out by June 30, 2000. These "Tier 1" products will not be used after that date unless a specific exception has been made because no feasible alternatives exist.

King County and Seattle have established internal IPM steering committees that are overseeing implementation of these new policies. Research on alternatives, staff training, and development of specific guidelines are underway. Both jurisdictions are sharing information with others to encourage as much IPM-related activity as possible throughout the region. It is hoped that these public sector efforts to reduce pesticide use will serve as models for others, both public and private, to follow and will serve as opportunities to gain significant local experience on safer alternative practices.

Other Compliance Activities

In addition to the documents described above, the Appendix to this report also includes information on other compliance activities continuing in the County, water-related CIP projects (improving fish passage, etc.), and mapping of the County's storm sewer system.

S10 (B) 7: IDENTIFICATION OF KNOWN WATER QUALITY IMPROVEMENTS OR DEGRADATION

A public swimming beach monitoring program was conducted 1996-1999 as a cooperative effort of WLRD, KC Environmental Laboratory, and Seattle King County Public Health Department. In 1998, 21 public swimming beaches on lakes Washington, Sammamish, Five-Mile, Wilderness, Pine, Beaver, and Green Lake were sampled weekly from June through September. In 1999, the public swimming beaches on lakes Washington, Sammamish, and Green Lake were sampled weekly from June through September, while the other lakes were sampled by other

jurisdictions and private laboratories. All bacterial data was immediately transferred to the Seattle King County Public Health Department for determinations on public health and contacts with the local jurisdictions and parks departments, and published on the King County internet website http://splash.metrokc.gov/wlr/waterres/lakes/bacteria.htm).

Data from the beach monitoring program was used by the SKCPHD to identify potential public health problems. Juanita Beach (King County parks) and Meydenbauer Beach (City of Bellevue) on Lake Washington were closed to swimming one or more weeks in 1999, until monitoring showed bacterial counts back in an acceptable range. Bacterial sources were primarily goose feces, determined by RNA analysis at the University of Washington. This information was used to improve maintenance practices at the parks that contributed to the improved water quality in the public swimming areas. The City of Bellevue investigated Meydenbauer Beach, with background data from the KC Major Lakes Program and laboratory support from the KC Environmental Laboratory. This data is also being used in the long-term park planning efforts.

S10 (B) 8: STATUS OF WATERSHED-WIDE COORDINATION

As described in the 1999 report, the ESA listings of Puget Sound Chinook and Bull Trout have brought a new chapter in King County's long history of watershed-wide coordination. We have continued our efforts to develop watershed-based, multi-stakeholder, multi-jurisdictional salmon recovery and conservation plans in Water Resource Inventory Areas (WRIAs) around King County. During the past year a number of developments have occurred, ranging from organizational changes to the development of a proposed 4(d) rule (the Tri-County Framework) that includes regulatory changes, habitat preservation and restoration activities, and long-term WRIA-based conservation planning. Additionally, the Department of Natural Resources has acquired and developed highly skilled habitat restoration professionals and crews that serve the region's salmon recovery efforts by implementing high quality, on-the-ground projects.

The inter-jurisdictional Watershed Forums, described in the County's SWMP, are still active and have received increased staff support since 1998. The Forums are working to formalize their role as a local government caucus to the WRIA Steering Committees and the Forums have continued to support water quality, flood control, and habitat restoration activities such as the development of watershed-wide erosion control standards, acquisition of key habitat sites, and volunteer planting events. Before November of 1999, the Forums identified $250 million in capital expenses for regional water resource management needs, and were considering a regional funding mechanism to implement these projects. Following the passage of Initiative 695 and the requirement that all new fees go through a public vote, the jurisdictions have deferred the creation of a regional funding source and are instead pursuing a cost share to support WRIA-based salmon recovery efforts.

In 1999, the multiple stakeholders represented on the Steering Committees worked towards formalizing their relationship with the local jurisdictions represented on the Forums. It was recognized that implementation of WRIA plan recommendations would, for the most part, be the

responsibility of local governments. For this reason, the Steering Committee (which does not include all local governments in the watershed) is working with the Forums to create an Inter-Local Agreement (ILA) that would (1) define the relationship between the planning body (the Steering Committee) and the implementing body (the Forums), and (2) outline a cost-sharing agreement to fund such things as Forum and Steering Committee administration, watershed assessments, and possibly plan implementation. It is anticipated that the ILA will be signed sometime during 2000.

In addition, a Nearshore Technical Committee has recently been formed to complement the freshwater expertise on the WRIA technical committees. The formation of the Nearshore Technical Committee as an advisory committee to the WRIA planning efforts will help to ensure that WRIA plans are informed by a comprehensive understanding of ecosystem processes and functions.

The Steering Committees and Forums have received regular updates on the status of the Tri-County Framework proposed for inclusion in the Section 4(d) rule for Puget Sound Chinook. In addition to long-term WRIA planning for salmon conservation, the Framework includes an "early action program" that contains regulatory elements such as a 14-element stormwater management program, a nine-element regional road management program (including a regional forum for discussion, coordination, and adaptive management of road maintenance activities), and a riparian management zone (including a no-touch buffer around streams, lakes, and wetlands). Finally, the Framework includes the development and implementation of long-term, WRIA-based salmon recovery plans based on detailed watershed assessments. The Steering Committees and Forums have served as a venue for information-sharing about the status of Tri-County negotiations with NMFS, the potential impact of the Framework on local governments, and the role of the early action program and WRIA planning in ESU-wide salmon recovery. The proposed Framework is available at http://www.salmoninfo.org/tricounty/framework.htm.

Finally, King County continues its implementation of the six basin plans developed in the late-1980s and early-1990s, including capital improvements, enforcement of regulatory changes, and an ongoing basin stewardship program. More information on the status of these efforts can be found in the Appendix.

CONCLUSION

The County's SWMP continues substantially as planned and disclosed in our approved submittal, although the emphasis of our management activities has shifted to addressing threats to the survival of salmonids and to making the water quality improvements (including improved habitat elements--not just water chemistry) necessary to assure that salmonids can thrive in our waters.